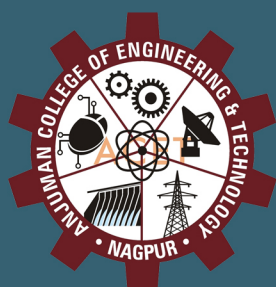# National Conference on Advances in Engineering and Applied Science (NCAEAS)

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Conference Details

A national level Student's Conference on Advances in Engineering & Applied Sciences, NCAEAS-2018 was organized by Electrical Department of Anjuman College of Engineering and Technology in the Nagpur City of Maharashtra state on 29 January 2018. It provided a general platform to UG, PG students and delegates from Industry for exchanging and sharing ideas, discussing recent developments and motivation from eminent researchers & academicians. NCAEAS-2018 was a multi-disciplinary conference with wide range of Tracks and Topics. The objective of the conference was to promote research and innovation at undergraduate and postgraduate level. High quality papers are presented in the conference and selected papers were published in the proceedings of the conference. Total 120 papers were received from all over India, out of which 109 paper were selected for presentation and publication.

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CONTENTS

Design and Fabrication of Hybrid Grass Cutter

Danish Khan*[1], Gaurav Dhotre[1], Kaustubh Ramteke[1], Mohit Borkar[1], Salman Khan[1], Aman Talewar[1], Prof. Pramod Gadge[2]

[1]B.E. Student, Department of Electrical Engineering, A. C. E. T. Nagpur, Maharashtra, India
[2] Associate professor, Dept. of Electrical Engineering, A. C. E. T. Nagpur, Maharashtra, India

ABSTRACT

The present technology which is commonly used for trimming the grass is by using the manually handle device. In this paper we have proposed, specially designed and fabricated a semi-automated hybrid machine using a wireless remote controller in which various functions such as trimming the grass, floor moping, fan operation, mobile charging, emergency light, pesticide/insecticide sprayer and bird repellent siren, etc. are incorporated in a single hybrid machine.

The device consists of linear blade which is operated with the help of motor. The power supply to the motor is given by using a battery. The battery is charged by using a solar panel, and alternatively it can be powered by using an AC source. The system uses a 12 volt battery to power the vehicle movement as well as the grass cutting motor. The vehicle is fabricated using PVC pipes so as to make the vehicle light in weight, robust and non-corrosive. It has an IR sensor for obstacle detection in case if an obstacle is detection the IR sensor will monitor it and the switch arrangement will stops the grass cutting motor to avoid any accident.

Keywords: Solar Panel, Battery, DC Motor, Obstacle Sensor, Blade.

I.   INTRODUCTION

In the field of manufacturing engineering product design plays key role in terms of geometrical parameter i.e., size shape and easiness for users. There is lots of progress in today's world but there is still some labour power which requires lots of income allocation for a small work. So it is required that exertion should have some other substitute so that the labour power surplus can be avoided.

Moving the grass cutters with a standard IC engine is not feasible, and no one takes contentment in it. Cutting grass cannot be effortlessly accomplished by elderly, younger, grass cutter moving with engine create noise pollution due to the loud engine, and local air pollution due to the combustion in the engine. Also, a motor powered engine requires intermittent maintenance such as altering the engine oil. Even though electric solar grass cutter is eco friendly. The trial product will also be charged from sun by using solar panels. The design of solar powered agricultural equipment (e.g. grass cutter) will include direct current (D.C) motor, a rechargeable battery, solar panel, and control switch.

In our project we are trying to make a daily purpose machine which is capable of cutting the grass in lawn, for floor cleaning, insect killer, and as a fan. The system will have some automation work for assistance and other obstacle recognition. The supply to the system is given by a battery which is charged using a solar panel which is attached on the top of the machine and it can also be powered by using AC source.

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II. METHODS AND MATERIAL

Main Components

1. Solar panel
2. Battery
3. Charge controller
4. DC motor
5. IR sensor
6. Blades
7. Rf Module With Controller
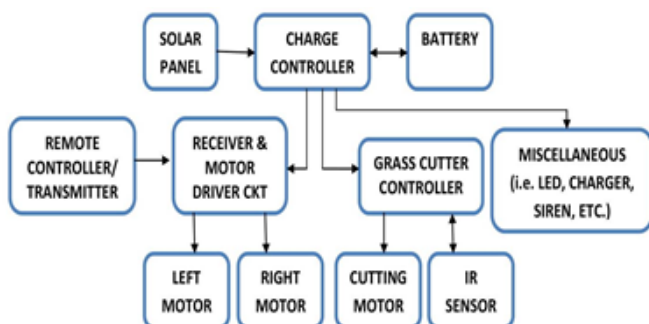
Figure 1. Block diagram of hybrid grass cutter

SOLAR PANEL

Solar energy is clean, cheap and abundantly available. Here we are using polycrystalline type solar panel.

The grass cutter works on the photovoltaic principle. When photons from sun are absorbed in a semiconduter that produces free electrons with higher energies, these electrones are combining with holes in semiconducter and produces electron hole pair and hence th external conducter constitutes electrical current to do useful work. The specifications of solar panel we are using is 40W, Voc = 22.18, Isc = 2.36.

CHARGE CONTROLLER

The charge controller sits between the array of panels, the batteries, and the equipment or loads. By monitoring the voltage of battery, the charge controller disconnect the array of panels from the battery to avoid overcharging, and they disconnect the battery from the load to avoid over discharging. The connection and disconnection is done by means of switches which can be of two types: electromechanical (relays) or solid state (bipolar transistor). the switch opens the charging circuit when the voltage in the battery reaches its high voltage disconnects (HVD) or cut-off set point. The low voltage disconnects (LVD) prevents the battery from over discharging by disconnecting the load. The specifications of charger that we are using in this project is 12volt, 10amp, 2 load arrengment.

BATTERY

The batteries are used as a storage device for solar energy which can be further converted into electrical energy. The specifications of battery that we are using in this project is Ni-cd sealed maintenance free, 12 Volts, 26Ah. The battery should have properties like Long life, High reliability, Low cost, High overall efficiency

DC MOTOR

Here the dc motors used are 12V, 10,000 rpm, permanent magnet DC motors for grass cutting,

mopping and fan operation. 2 Motors which is of 12V, 30 rpm are used to power the wheel that would rotate in the desired direction. Another motor and pump is connected with the tank and nozzle so as to carry out the sprinkling action when required.

Advantages of a brushed DC motor include low initial cost, high reliability, and simple control of motor speed. Disadvantages are high maintenance and low life-span for high intensity uses.

IR SENSOR FOR OBSTACLE DETECTION

An object can be detected with an infrared system consisting of an infrared transmitter and a receiver. An IR transmitter, also known as IR LED, sends an infrared signal with a certain frequency compatible with an IR receiver which has the task to detect it. The IR transmitter sends an infrared signal that, in case of a reflecting surface (e.g. white color), bounces off in some directions including that of the IR receiver that captures the signal detecting the object. When the surface is absorbent (e.g. black color) the IR signal isn't reflected and the object cannot be detected by the sensor. This result would occur even if the object is absent.

RF MODULE WITH CONTROLLER

In this project RF module is used for remotely access of hybrid grass cutter. An RF module (radio frequency module) is a (usually) small electronic device used to transmit and receive radio signals between two devices. In an embedded system it is often desirable to communicate with another device wirelessly. RF communications incorporate a transmitter and receiver.

BLADES

Nylon blade: Length of wire: 10cm
Internal diameter: 10mm

Steel blade: Diameter of blade: 12.5 cm
Internal diameter: 10mm

METHODOLOGY

- The project mainly concentrates on designing a suitable operating system. To maintain simplicity and economy in the design the locally fabricated unit has been used. The hybrid machine is fabricated using PVC pipes so as to make the vehicle light weight, robust and non-corrosive.

- The working of hybrid grass cutter is, it has solar panel mounted in a PVC chassis with adjustable arrangement so as to direct the solar panel towards sun at an angle of 45 degrees in such a way that it can receive solar radiation with high intensity easily from the sun. These solar panels convert solar energy into electrical energy, now this electrical energy is stored in batteries by using a solar charger. The main function of the solar charger is to disconnect the solar panels from the batteries when they are fully charged and also connects to the panels when the charging in batteries is low.

- The chassis is powered by 2 dc geared motor which is also supplied from same power source. The chassis is remotely operated using RF module. For forward/reverse movement both the motor are supplied at the same time by module and for left/right operation any one motor is connected to the power source.

- The motor is connected to the batteries through Charge controller. Between these a two motor driver is provided. It starts and stops the working of the motor. From this motor, the power transmits to the mechanism and this makes the blade to rotate with high speed and this makes to cut the grass as well as mopping operation. The blade will get kinetic energy while increasing the rpm. The cutting edges are very smooth and accurate .Also Electric Grass Cutting Machines are much easier to be used in

garden, lawn and grass fields. In order to enhance the beauty of lawns and play grounds.

Also an arrangement is also provided to cut the grass in required length.

- For fan/blower operation the movable arm is tilt to 90° vertical and replacing the detachable cutting blade with fan propeller we can use the same project for fan operation.
- The project also has additional features like mobile charging, emergency light, pesticide/insecticide sprayer and bird repellent siren.

III. RESULTS AND DISCUSSION

EQUATIONS

Force required by cutting blade to shear the grass is given by;

$$F = T/R \qquad .... (1)$$

Where,

T = Shaft torque

R = Radius of cutting blade

Shaft torque is given by;

$$T = P/2\pi N \qquad ....(2)$$

Electrical power is given by;

$$P = I * V \qquad .... (3)$$

Torque of motor is given by;

$$P = 2\pi NT / 60 \qquad .... (4)$$

$$T = (P*60) / (2\pi N) \qquad .... (5)$$

CALCULATIONS

$$\text{Amp hour} = \frac{\text{Total wattage of load}}{\text{Total voltage}} * \text{Working time}$$

= (54*5) / 12

=22.5 Ah

Hence we are using 26Ah Lead Acid Battery

$$\text{Wattage hour of battery} = \text{Amp hour} * \text{total voltage}$$

=26*12

=312 WHr

$$\text{Time required for charging} = \frac{\text{WHr}}{\text{panel wattage}}$$

=312WHr /40W

=7.8 Hr

Hence time require for 100% charging using 40W solar panel is approximately 8Hour

COMPARISON

Table 1. Comparison Between Solar and IC Engine Cutter

Sr. No	Particular	Solar Based Grass Cutter	IC Engine Grass cutter
1	Pollution	No	Pollution is great factor
2	Fuel	No fuel consumption	Fuel is major factor
3	Friction	Greatly reduced	High
4	Cost	Low	High
5	Maintenance	Low	High
6	Load carrying capacity	Low	High

IV. CONCLUSION

The project entitled "Design and Fabrication of hybrid grass Cutter" is successfully completed and the results obtained are satisfactory.

The presented paper provides the fabricated information to the common man as it is having much more advantages i.e. smooth grass cutting operation with an adjustable arrangement provided, no fuel cost, no pollution, cost effective, less wear and tear because of less number of moving components, and as the chassis is fabricated using PVC pipes, it makes the vehicle light weight, robust and non-corrosive. Also Non skilled person can also handle it easily. The system is operated by using solar energy. Also this system is having facility of charging the batteries while the solar powered grass cutter is in motion. So it is much more suitable for grass cutting also. The same thing can be operated in night time also, as there is a facility to charge these batteries in day light. Other features of Hybrid grass cutter like floor moping, fan operation, mobile charging, emergency light, pesticide/insecticide sprayer and bird repellent siren are working efficiently and make our project a multipurpose machine.

V. FUTURE SCOPE

Microcontrollers and advanced electronic devices can be used for further modifications like path algorithm, ultra sonic sensors for obstacle detection, PIR sensors for human detection and automatic movement decision controller of chassis when obstacle is detected. Wi-Fi based Remote access with camera installed in chassis so as to see the ground view while operation.

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6

REVIEW ON RFID and GSM Based College Bus Tracking System

M. T. Hasan*, Anam Farooqui, Payal Malkhede, Chitra Pillay, Naheed Tabassum

Department of Electronics Engineering, Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

This paper describes an automated attendance management system that can be employed at professional gatherings of different types (conferences, exhibitions, training courses, etc.) and scales (from small-to-medium seminars and workshops to large congresses and technical shows). The system is based on application of RFID, mobile communication and IT technologies. It is capable of collecting, recording and processing data on participants of a technical gathering and their activities, attendance or different sessions, visiting different exhibition booths, etc. The system can also generate real-time combined detail reports on attendance, inflow and outflow of the participants during the event, their most and least preferred interests and activities, etc. This can be done for a multitude of locations and premises, and during an extended period of time.

Keywords: Active RFID, GSM message, cellular phone, kindergarten, RFID, Biometric, GSM Modem.

I. INTRODUCTION

Traditionally, the security of kindergartens is highly relied on the human's effort and attention like guardians and teachers. However, if there is no active informing service provide by kindergartens usually, parents have no idea of when and whether their children safely arrive in their classroom after they are picked up by school bus. Every morning the student attendance offers the first hand information of children safety. But sometimes it is complicated to exactly track the attendance since the children arrive in a period of time in the morning and some of them come with their parents and some come by school bus. So we develop an active RFID attendance system to overcome the barriers and mistakes of manually taking attendance and combine the wireless GSM message service to provide real time responses to their parents' cellular phone. Parents

can check the message and understand when their children are safely arrived. On the contrary, a noticing message will be broadcasted to administrators and parents if the children do not show up in a class on time so that the adults have the enough time to check out these particular children and prevent accident happens. Another main purpose of the system is used to relieve the traffic jam around the kindergarten after class, parents drive to school to pick up their children at the same time. Many cars would get stuck by the kindergarten because they all temporarily park in front of the school and wait the guardians to find out their children and bring them out. The traffic chaos is more serious especially on rainy days or the kindergarten is located on a busy district. With the prior distributed RFID tags carried by parents, the system can detect the approaching cars in a specific

distance and identify the children who would be picked up next. Thus, the school broadcasting system would read the children name and guardians could bring them out so that these parent cars can pick up their children without additional waiting. The rest of this paper is organized as follows. Section 2 describes the variety of RIFD applications on different domains. Section 3 presents the system architecture and describes how to construct the active student attendance system with RFID and how to solve the traffic jam around kindergartens after class. Section 4 details the encountered barriers while implementing the system with the chosen equipments. Finally, section 5 concludes the paper and describes our future works.

II. METHODS AND MATERIAL
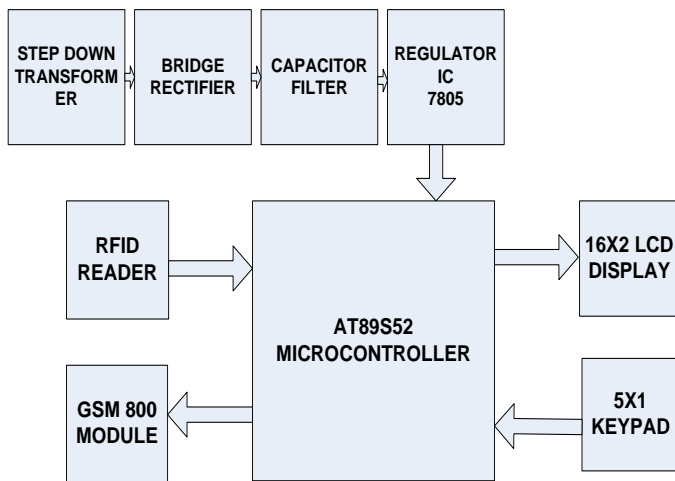
Figure1. Block Diagram of Proposed System

The main components of the project are 8051 based microcontroller, 16×2 LCD, and RFID reader module.

First we'll see the basic connections with respect to the microcontroller. Here, we'll need to connect a crystal, a reset circuit and external access.

To use the on-chip oscillator, an 11.0592 MHz quartz crystal is connected to pins 18 (XTAL2) and 19 (XTAL1) of the microcontroller. Two 33pF ceramic capacitors are connected from the crystal to ground.

The reset on the 8051 microcontroller is active high i.e. upon applying a high pulse to RST pin, the microcontroller will reset. A 10KΩ resistor is connected from the RST (Pin 9) of the microcontroller to ground.

A 10µF electrolytic capacitor is connected between the positive supply and RST pin. A push button is connected across the capacitor.
The External Access pin (Pin 31) is connected to positive supply using a 10KΩ resistor. This completes the basic connections with respect to microcontroller.

Now we'll connect the LCD to microcontroller. To adjust the contrast of the display, a pot is connected to contrast adjust pin i.e. Pin 3 of LCD.

First, connect the three control pins of the LCD i.e. RS, RW and E to P3.6, GND and P3.7. Then connect the 8 data pins of the LCD display to PORT1 pins of the microcontroller.

After connecting the display, now we are going to connect the RFID reader module. Connect the TX pin of RFID Reader to RXD pin i.e. P3.0 of the microcontroller. Similarly, connect the RX pin of RFID Reader to TXD pin i.e. P3.1 of the microcontroller.

Finally, a button is connected to P3.3 (IN) to view the attendance details.

The aim of this project is to design an RFID Technology based Attendance System using 8051 microcontroller, in which the attendance of students or employees is automatically recorded with the swipe of a card. The working of the project is explained here.

When this circuit is powered ON, initially the microcontroller will display the message as Swipe the card on the LCD display. When the RFID reader detects the ID card, it will send the unique card no to the microcontroller via serial terminal.

With the help of suitable programming, we need to compare the received card no. with the numbers that are already stored in the microcontroller or any database.

Once, if any of these numbers are match with the received card no., then the corresponding name stored in that no. is displayed on the LCD display and also the attendance for the name stored in the corresponding number is marked.

By pressing the button, the attendance recording will be closed and the details are displayed on the LCD repeatedly until the microcontroller has been reset.

A. RFID Reader

III. RESULTS AND DISCUSSION

To test the operation of the system prototype including several RFID readers by using one prototype board of the RFID reader, it changes the value of the on-board DIP switch to stimulate different room locations. RFID reader device is used to sense the identification tags of participants and transmit the information to the remote server.

Figure bellow shows Proteus simulation of proposed system
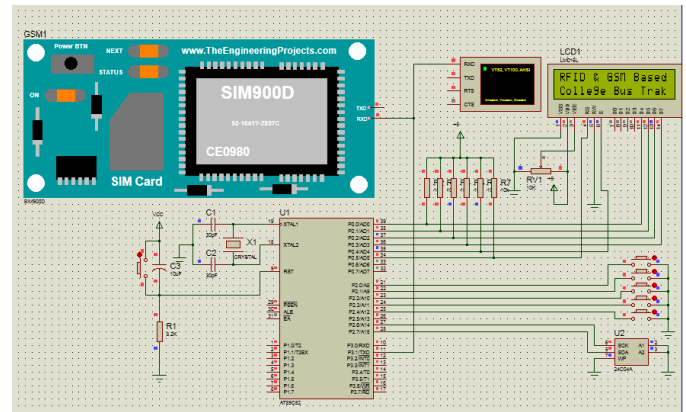
Figure 2. Proteus Simulation of Proposed System

IV. CONCLUSION

This paper demonstrates how an automation of attendance system can be implemented using RFID, Biometric, and GSM Modem. Also the paper presents the successful development and prototyping of a low-cost event attendance and tracking management system. It is based on the use of RFID technology combined with the use of wireless communications and data analytics delivered by the system server.

The future enhancements in the system can be that the doors of the classrooms, laboratories etc. are managed by the system itself and are unlocked and locked accordingly. Software can be made for the mobile phones and then using the mobile phones GPS (Global Positioning System) the location of the student can be known all over the place and not only the campus. The same ID card can also be used for other functionality of the university like the library card for issuing of books and for example the exam identification card.

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Thermal Deflection In A Semi-Infinite Solid Cylinder Subjected To Internal Heat Generation

Yusuf I. Quazi[1], Sajid Anwar[2]

[1]Department of Mathematics, Anjuman College of Engineering and Technology Sadar, Nagpur, Maharashtra, India

[2]Department of Mathematics, Anjuman College of Engineering and Technology Sadar, Nagpur, Maharashtra, India

ABSTRACT

The present paper deals with the determination of thermal deflection in a semi-infinite circular cylinder defined as $0 \leq r \leq b, 0 \leq z < \infty$ due to internal heat generation within it. A circular cylinder is considered having arbitrary initial temperature and subjected to time dependent heat flux at the fixed circular boundary $r = b$ whereas the zero temperature at the lower surface $(z = 0)$ of the semi-infinite circular cylinder. The governing heat conduction equation has been solved by using Integral transform method. The results are obtained in series form in terms of Bessel functions. The results for thermal deflection have been computed numerically and illustrated graphically.

Keywords: Thermoelastic problem, Non-homogeneous heat conduction equation, internal heat generation ,Semi-infinite circular cylinder.

I. INTRODUCTION

Boley and Weiner [1] studied the problems of thermal deflection of an axisymmetric heated circular plate in the case of fixed and simply supported edges. Roy choudhury [2] discussed the normal deflection of a thin clamped circular plate due to ramp type heating of a concentric circular region of the upper face. This satisfies the time-dependent heat conduction equaton. Deshmukh and Khobragade [3] has determined a quasi-static thermal deflection in a thin circular plate due to partially distributed and axisymmetric heat supply on the outer curved surface with the upper and lower faces at zero temperature. Deshmukh et al. [5] has determined the thermal stresses in a hollow circular disk due to internal heat generation within

it. Recently Deshmukh et al. [6] studied the thermal deflection in a thin circular plate subjected to heat generation within it.

In this paper the work of Deshmukh et al. [6] has been extended for two dimensional non-homogeneous boundary value problem of heat conduction and studied the thermal deflection of thin clamped semi-infinite solid circular cylinder defined as $0 \leq r \leq b, 0 \leq z < \infty$ due to internal heat generation within it. A circular cylinder is considered having arbitrary initial temperature and subjected to time dependent heat flux at the fixed circular boundary $r = b$ whereas the zero temperature at the lower surface $(z = 0)$ of the

semi-infinite circular cylinder. The governing heat conduction equation has been solved by using integral transform technique. The results are obtained in series form in terms of Bessel's functions. The results for thermal deflection have been computed numerically and are illustrated graphically. It is believe that this particular problem has not been previously considered.

The rotating hollow circular disk is having the applications in Aerospace engineering particularly in gas turbines and gears. The hollow circular disk is normally work under thermo-mechanical loads.

II. FORMULATION OF THE PROBLEM

A : HEAT CONDUCTION EQUATION

Consider a semi-infinite circular cylinder occupying space D defined by $0 \le r \le b, 0 \le z < \infty$. Initially the cylinder is at arbitrary temperature $F(r, z)$. The time dependent heat flux $f(z,t)$ is applied on the fixed circular boundary $(r = b)$ whereas the zero temperature at the lower surface $(z = 0)$ of the semi-infinite circular cylinder. Heat generate within the semi infinite circular cylinder at the rate of $\dfrac{g(r,z,t)}{K}$. Under these conditions, the displacement and thermal stresses, in a semi-infinite circular cylinder due to heat generation are required to be determined.

The temperature of the semi-infinite circular cylinder satisfying the differential equation,

$$\frac{\partial^2 T}{\partial r^2} + \frac{1}{r}\frac{\partial T}{\partial r} + \frac{\partial^2 T}{\partial z^2} + \frac{g(r,z,t)}{K} = \frac{1}{\alpha}\frac{\partial T}{\partial t} \qquad \text{in } 0 \le r \le b, 0 \le z < \infty \qquad (1)$$

with boundary conditions

$$k\frac{\partial T}{\partial r} = f(z,t) \qquad \text{at } r = b \quad t > 0 \qquad (2)$$

$$T = 0 \qquad \text{at } z = 0 \quad t > 0 \qquad (3)$$

and
the initial condition

$$T = F(r, z) \qquad \text{when } t = 0 \qquad (4)$$

where K and α are thermal conductivity and thermal diffusivity of the material of the semi-infinite circular cylinder respectively.

B : THERMAL DEFLECTION

The differential equation satisfying the deflection function $\omega(r,t)$ is given as

$$\nabla^4 \omega = -\frac{\nabla^2 M_T}{D(1-v)} \qquad (5)$$

where, M_T is the thermal moment of the disk defined as

$$M_T = a_t \, E \int_0^h T(r,z,t) z \, dz \qquad (6)$$

D is the flexural rigidity of the disk denoted as

$$D = \frac{Eh^3}{12(1-\nu^2)} \qquad (7)$$

a_t, E and ν are the coefficients of the linear thermal expansion, the Young's modulus and Poisson's ratio of the disk material respectively and

$$\nabla^2 = \frac{\partial^2}{\partial r^2} + \frac{1}{r}\frac{\partial}{\partial r} \qquad (8)$$

Since, the circular edge of the semi-infinite circular cylinder is fixed are clamped;

$$\omega = \frac{\partial \omega}{\partial r} = 0 \quad \text{at} \quad r = b \qquad (9)$$

Initially $\quad T = \omega = F(r,z) \quad$ at $\quad t = 0$

Equations (1) to (9) constitute the mathematical formulation of the thermoelastic problem in a semi-infinite solid circular cylinder.

SOLUTION

A : HEAT CONDUCTION EQUATION

To obtain the expression for temperature distribution function $T(r,z,t)$ we introduce the Fourier transform and its inverse transform over the variable z in the range $0 \le z < \infty$ defined in [3] as

$$\bar{T}(r,\eta,t) = \int_0^\infty K(\eta,z') T(r,z',t) dz' \qquad (10)$$

$$T(r,z,t) = \int_0^\infty K(\eta,z) \bar{T}(r,\eta,t) d\eta \qquad (11)$$

where

Kernel $\quad K(\eta,z) = \sqrt{\dfrac{2}{\pi}} \sin \eta z$.

Taking the integral transform of system (1-5) by applying the transform equation (10), one obtains

$$\frac{\partial^2 \bar{T}}{\partial r^2} + \frac{1}{r}\frac{\partial \bar{T}}{\partial r} - \eta^2 \bar{T} + \frac{\bar{g}}{K}(r,\eta,t) = \frac{1}{\alpha}\frac{\partial \bar{T}}{\partial t} \qquad (12)$$

$$k\frac{\partial \bar{T}}{\partial r} = \bar{f}(\eta,t) \qquad \text{at} \qquad r = b \qquad (13)$$

$$\overline{T} = \overline{F}(r, \eta) \qquad \text{for} \quad t = O \tag{14}$$

Secondly, we define the finite Hankel transform and its inverse transform over the variable r in the range $0 \le r \le b$ as

$$\overline{\overline{T}}(\beta_m, \eta, t) = \int_0^b r' K_0(\beta_m, r') \overline{T}(r', \eta, t) dr' \tag{15}$$

$$\overline{T}(r, \eta, t) = \sum_{m=1}^{\infty} K_0(\beta_m, r) \overline{\overline{T}}(\beta_m, \eta, t) \tag{16}$$

where kernel is $K_0(\beta_0, r) = \dfrac{\sqrt{2}}{b} \dfrac{J_0(\beta_m r)}{J_0(\beta_m b)}$ $\tag{17}$

and $\beta_1, \beta_2, \dots$ are the positive roots of the transcendental equation

$$J_1(\beta_m b) = 0 . \tag{18}$$

Now we take the integral transform of the system (12-14) by applying the transform (15), one obtains

$$\frac{d\overline{\overline{T}}}{dt} + \alpha \left(\eta^2 + \beta_m \right) \overline{\overline{T}} = A(\beta_m, \eta, t) \tag{19}$$

$$\overline{\overline{T}}(\beta_m, \eta, t) = \overline{\overline{F}}(\beta_m, \eta) \quad \text{for} \ t = 0 \tag{20}$$

where $A(\beta_m, \eta, t) = \dfrac{\alpha}{k} \overline{\overline{g}}(\beta_m, \eta, t).$ $\tag{21}$

Solution of the equation (19) is obtained as

$$\overline{\overline{T}}(\beta_m, \eta, t) = e^{-\alpha\left(\beta_m^2 + \eta^2\right)t} \left[\overline{\overline{F}}(\beta_m, \eta) + \int_{t'=0}^{t} e^{\alpha\left(\beta_m + \eta^2\right)t'} A(\beta_m, \eta, t) dt' \right] \tag{22}$$

The resulting double transform of temperature is inverted successively by means of the inversion formulas (16) and (11). Then we obtain the expression of temperature $T(r, z, t)$ as

$$T(r, z, t) = \int_0^\infty \sum_{m=1}^{\infty} K(\eta, z) K_0(\beta_m r) e^{-\alpha\left(\beta_m^2 + \eta^2\right)t} \left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha\left(\beta_m + \eta^2\right)t'} A(\beta_m, \eta, t) dt' \right] d\eta \tag{22}$$

$$T(r, z, t) = \sqrt{\frac{2}{\pi}} \int_0^\infty \sum_{m=1}^{\infty} \sin \eta z \, K_0(\beta_m r) e^{-\alpha\left(\beta_m^2 + \eta^2\right)t} \left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha\left(\beta_m + \eta^2\right)t'} A(\beta_m, \eta, t) dt' \right] d\eta \tag{23}$$

$$T(r,z,t) = \frac{2}{\sqrt{\pi b}} \int_0^\infty \sum_{m=1}^\infty \sin \eta z \frac{J_0(\beta_m r)}{J_0(\beta_m b)} e^{-\alpha(\beta_m^2 + \eta^2)t}$$

$$\times \left[\frac{2}{\sqrt{\pi b}} \int_0^b \int_0^\infty r' \sin \eta z' \frac{J_0(\beta_m r)}{J_0(\beta_m b)} F(r', z') dr' dz' \right. \tag{24}$$

$$\left. + \int_{t'=0}^t e^{\alpha(\beta_m + \eta^2)t'} \frac{\alpha}{K} \frac{2}{\sqrt{\pi b}} \int_0^b \int_0^\infty r' \sin \eta z' \frac{J_0(\beta_m r)}{J_0(\beta_m b)} g(r'z't') dz' dr' dt' \right] d\eta.$$

B. THERMAL DEFLECTION

Using Eq. 23 into Eq. 6, one obtains

$$M_T = \sqrt{\frac{2}{\pi}} a_t E \int_0^\infty \sum_{m=1}^\infty K_0(\beta_m r) e^{-\alpha(\beta_m^2 + \eta^2)t}$$

$$\left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha(\beta_m + \eta^2)t'} A(\beta_m, \eta, t) dt' \right] d\eta \int_0^\infty z \sin \eta z dz \tag{26}$$

Assume the solution of Eq.5 satisfy condition 9 as

$$\omega(r,t) = \sum_{m=1}^\infty C_m(t) \left[J_0(\beta_m r) - J_0(\beta_m b) \right] \tag{27}$$

where β'_m are the positive roots of the transcendental equation

$$J_1(\beta_m b) = 0 .$$

It can be easily shown that

$$\omega = \frac{\partial \omega}{\partial r} = 0 \quad \text{at} \quad r = b$$

Now,

$$\nabla^4 \omega = \left(\frac{\partial^2}{\partial r^2} + \frac{1}{r}\frac{\partial}{\partial r} \right)^2 \sum_{m=1}^\infty C_m(t) \left[J_0(\beta_m r) - J_0(\beta_m b) \right] \tag{28}$$

Using the well known result

$$\left(\frac{\partial^2}{\partial r^2} + \frac{1}{r}\frac{\partial}{\partial r} \right) J_0(\beta_m r) = -\beta_m^2 J_0(\beta_m r) \tag{29}$$

Substitute this value in above equation

$$\nabla^4 \omega = \sum_{m=1}^\infty C_m(t) \beta_m^4 \left[J_0(\beta_m r) - J_0(\beta_m b) \right] \tag{30}$$

$$\nabla^2 M_T = \sqrt{\frac{2}{\pi}} a_t E \left(\frac{\partial^2}{\partial r^2} + \frac{1}{r} \frac{\partial}{\partial r} \right) \int_0^\infty \sum_{m=1}^\infty K_0(\beta_m r) e^{-\alpha(\beta_m^2 + \eta^2)t}$$

$$\left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha(\beta_m + \eta^2)t'} A(\beta_m, \eta, t) dt' \right] d\eta \int_0^\infty z \sin \eta z dz$$

$$\nabla^2 M_T = \sqrt{\frac{2}{\pi}} a_t E \beta_m^2 \int_0^\infty \sum_{m=1}^\infty K_0(\beta_m r) e^{-\alpha(\beta_m^2 + \eta^2)t}$$

(31)

$$\left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha(\beta_m + \eta^2)t'} A(\beta_m, \eta, t) dt' \right] d\eta \int_0^\infty z \sin \eta z dz$$

Substituting eq 28 and eq 31 in eq 5 we get

$$\sum_{m=1}^\infty C_m(t) \beta_m^4 J_0(\beta_m r) = -\sqrt{\frac{2}{\pi}} a_t E \frac{1}{D((1-v))} \beta_m^2 \int_0^\infty \sum_{m=1}^\infty K_0(\beta_m r) e^{-\alpha(\beta_m^2 + \eta^2)t}$$

(32)

$$\left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha(\beta_m + \eta^2)t'} A(\beta_m, \eta, t) dt' \right] d\eta \int_0^\infty z \sin \eta z dz$$

$$C_m(t) = -\frac{2}{\sqrt{\pi b}} a_t E \frac{1}{D((1-v))} \int_0^\infty \frac{1}{\beta_m^2 J_0(\beta_m b)} e^{-\alpha(\beta_m^2 + \eta^2)t}$$

(33)

$$\left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha(\beta_m + \eta^2)t'} A(\beta_m, \eta, t) dt' \right] d\eta \int_0^\infty z \sin \eta z dz$$

Putting the value of eq 36 in eq 27 we get

$$\omega(r, t) = -\frac{2}{\sqrt{\pi b}} a_t E \frac{1}{D((1-v))} \int_0^\infty \frac{(J_0(\beta_m r) - J_0(\beta_m b))}{\beta_m^2 J_0(\beta_m b)} e^{-\alpha(\beta_m^2 + \eta^2)t}$$

(34)

$$\left[\overline{\overline{F}}(\beta_m, \eta) + \int_0^t e^{\alpha(\beta_m + \eta^2)t'} A(\beta_m, \eta, t) dt' \right] d\eta \int_0^\infty z \sin \eta z dz$$

SPECIAL CASE

Setting:

$$F(r, z) = z^2 \times (r^2 - b^2)^2$$

$$f(z, t) = z^2 \times e^{-\omega t}, \omega > 0$$

$$g(r, z, t) = g_{pi}.\delta(r - r_1).\delta(z - z_1).\delta(t - \tau)$$

with $\omega = 10, t \to \tau = 5$, $g_{pi} = 50$

where r is the radius measured in meter, δ is the Dirac-delta function, $\omega > 0$.

The heat source $g(r, z, t)$ is an instantaneous point heat source of strength $g_{pi} = 50 \ J/m$ situated at the center of the semi-infinite circular cylinder along radial direction and releases its heat instantaneously at the time $t \to \tau = 5$.

DIMENSIONS :

Radius of a semi-infinite circular plate $\qquad b = 1\,m$

Central circular paths of semi-infinite circular cylinder $\qquad r_1 = 0.5\,m$.

MATERIAL PROPERTIES:

The numerical calculation has been carried out for a Copper (Pure) thin circular cylinder with the material properties as,

Thermal diffusivity $\alpha = 112.34 \times 10^{-6}\,(m^2 s^{-1})$.

Thermal conductivity $K = 386\,(W/mk)$.

Density $\rho = 8954\,kg/m^3$.

Specific heat $c_p = 383\,J/kgK$,

Poisson ratio $\nu = 0.35$,

Coefficient of linear thermal expansion $a_t = 16.5 \times 10^{-6}\,\dfrac{1}{K}$,

Lamé constant $\mu = 26.67$.

ROOTS OF TRANSCENDENTAL EQUATION:

The $\beta_1 = 3.8317$, $\beta_2 = 7.0156$, $\beta_3 = 10.1735$, $\beta_4 = 13.3237$, $\beta_5 = 16.470$,
$\beta_6 = 19.6159$, $\beta_7 = 22.7601$, $\beta_8 = 25.9037$, $\beta_9 = 29.0468$, $\beta_{10} = 32.18$

are the roots of transcendental equation $J_1(\beta b) = 0$.

We set for convenience,

$$X = \frac{2}{10^8 \sqrt{\pi b}}\,,\ Y = \frac{2(1+\nu)a_t}{10^7 \sqrt{\pi b}}\ \text{ and }\ Z = \frac{4(1+\nu)a_t \mu}{10^7 \sqrt{\pi b}}$$

The numerical calculation has been carried out with the help of computational mathematical software Mathcad-2000 professional and the graphs are plotted with the help of Excel (MS office-2007).
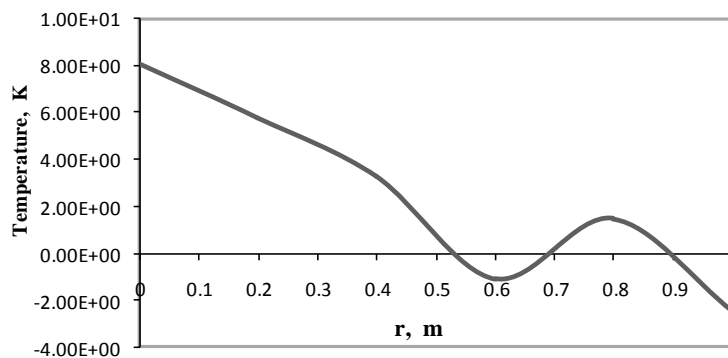
Figure 1. Temperature distribution

From fig. 1; it is observed that, the temperature is maximum at the centre of the cylinder due to arbitrary initial heat supply and goes on decreasing towards the mid point of the radius and it fluctuate due to point heat source towards the outer circular edge of the cylinder
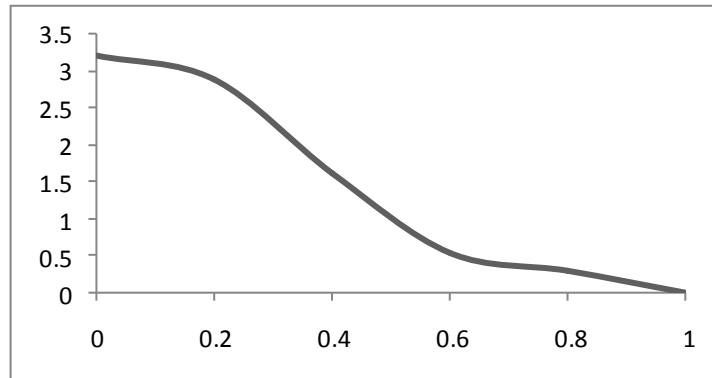
Figure 2. Deflection

From fig. 1; it is observed that, the deflection is maximum at the center and goes on decreasing towards end due to internal heat generation

III. CONCLUSION

In this paper we consider a semi infinite solid cylinder and discusses the quasi-static's thermal deflection at the outer surface .Thermal deflection is studied due to instantaneous point heat source of strength $g_{pi} = 50 \ J/m$ situated at the center of the semi-infinite circular cylinder along radial direction and releases its heat instantaneously at the time $t \to \tau = 5$.

Exact analytical solution have been develop for thermal deflection in a semi infinite circular cylinder experiencing internal heat generation and subject to arbitrary initial .heat supply on its outer surface while the radial and the tangential component can be compressed or tensile in nature depending on the level of heat generation and the temperature distribution ,the axial stresses compressive throughout the cylinder because of built in edge imposed

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A Review on Wireless Body Area Network for Health Monitoring

Mr.Khwaja Ramizuddin, Ashish Hasoriya, Aniket Puanikar, Desmond Michael, Siddharth Dhone
Electronics & Telecommunication, RTMNU/Anjuman College of Engineering & Tech., Nagpur, Maharashtra,
India

ABSTRACT

The Recent developments and technological advancements in wireless communication, Micro-Electro-Mechanical Systems (MEMS) technology and integrated circuits has enabled low-power, intelligent, miniaturized, invasive/non-invasive micro and nanotechnology sensor nodes strategically positioned in or around the human body to be used in diverse applications, such as personal health monitoring. Body area network (BAN) is the most advanced technology in wireless communications and electronics. The recent BAN's applications prove how this becoming more demanding to each one. Some of these applications are medical applications, it is possible to implant, or wear, tiny health monitoring sensor nodes on the body so that the fundamental body parameters and the movements of the patient can be recorded and communicated to the medical amenities for further actions such as processing and diagnosis as well as it is also used in non-medical application areas such as entertainment, military. Apart from that BAN have specific hardware and network necessities with low power consumption.

Keywords: Research Paper, Technical Writing, Science, Engineering and Technology.

I. INTRODUCTION

Wireless Sensor Networks (WSNs) are used for monitoring different types of parameters in various applications like environment monitoring applications e.g. checking temperature, humidity etc., habitant monitoring, combat zone, farming field checking ,air pollution monitoring, nuclear power plant observing and railway industry monitoring applications. Sensors nodes are used in wireless sensor networks for collecting the data, which are the main unit of wireless sensor networks. These sensors are placed in detecting area to screen field [1]. WBAN is new rising subfield of WSN. The main use of WBAN is well being examination. In WBAN, remote sensors are place on the human body or fixed

in the body to monitor essential signs like circulatory strain, body temperature, heart rate, glucose level etc. Utilization of WBAN innovation to monitor wellbeing parameters significantly decreases the consumptions of patient in health centre. Through the help of WBAN innovation, patients are observed at home for more periods. Sensors constantly sense information and forward to medicinal server. In WBANs, sensor hubs are worked with partial vitality source. It's needed to utilize least power for transmission information from sensing element hubs to sink. One of the most important obstructions in WBAN is to energize the batteries. A productive guiding convention is needed to overcome this issue of energizing batteries. Numerous vitality proficient directing conventions are planned in WSN

innovation. Yet, WSNs and WBANs have distinctive designs, applications and work in various circumstances. It is tough to port WSN steering conventions to WBAN. Hence, vitality effective directing convention for WBAN is required to screen patients for more period. We propose a high throughput, dependable and stable directing convention for WBAN. Sensors for ECG or graphical record and Glucose level are set close to the sink. Each of these sensors have basic data of patient and required least constriction, high unwavering quality and long life thusly; these sensors dependably transmit their information specifically to sink. Different sensors take after their protector hub and transmit their information to sink through forwarder hub. It spares vitality of hubs and system works for more periods. Mainly two varieties of devices can be distinguished: sensors and actuators. The sensors are used to measure certain parameters of the human body, either externally or internally. Examples include measuring the heartbeat, body temperature or recording a prolonged electrocardiogram (ECG). The actuators (or actors) on the other hand take some precise actions according to the data they collect from the sensors or through interaction with the user. E.g., an actuator equipped with a built-in reservoir and pump administers the correct dose of insulin to give to diabetics based on the glucose level measurements. Interaction with the user or other persons is usually handled by a personal device, e.g. a PDA or a smart phone which acts as a sink for data of the wireless devices [2][3].

II. APPLICATION OF WBAN

The major applications are healthcare, control and automation, home and office, environmental monitoring, logistics and transportation, security and surveillance, tourism and leisure, education and training and entertainment. The BAN applications are broadly divided into following categories. Medical applications include collecting various information of a patient and forward it to a monitoring centre for further analysis. BAN can also be used to help disable people. For example, retina prosthesis chips can be implanted in the human eye to see at an adequate level. Presently BANs are widely used for entertainment purpose, which includes 3D video and Games. Further the BANs are used for sports, in which sensors in BAN can collect coordinates movements of different parts of the body and subsequently make the movement of a character in the game, e.g., moving soccer player or capturing the intensity of a ball in table tennis. Last but not the least miscellaneous applications those include forgotten things monitoring, data file transfer and social networking applications. For better functionality authors discussed about the target system that has a scalable platform that requires minimum human interaction during setup and monitoring [4, 5].

III. SYSTEM REQUIREMENT

In order to make a WBASN useful and practical, some essential requirements have to be satisfied. These requirements are strongly related to the specific application. In our case study, the WBASN architecture must satisfy the following requirements:

A. Length of monitoring:
The cardiac activity needs to be monitored for an extended period especially for aged people suffering from cardiac arrhythmia. Long-term analyses on ECGs are required to predict eventual heart attacks. The application must allow continuous monitoring.

B. Reliability:

The reliability of measurements and message delivery to healthcare professionals is necessary, due to potentially life threatening episodes.

C. Power Management:

Sensor nodes have low power capacity and are assumed to be dead when they are out of power. The system must save energy especially when the aged subject is outside.

D. Time synchronization:

Each sensor runs at its own clock and has a different sample frequency. Accordingly time synchronization between sensors is needed.

E. Message delivery:

Vital signs are delivered within a certain time determined by the level of emergency. The architecture should allow real-time delivery of emergency vital signs for both indoor and outdoor surroundings. Messages carrying emergency vital signs require least delays.

F. Frequency of signal transmission and the amount of information:

Important questions are how often data has to be transmitted and how much data. In our application the physiological data is acquired for an extended period (8 hours for example) and downloaded to the base station in real time. The system ensures periodic transmission of regular vital signs and instant transmission of urgent messages. The application data traffic is determined by the sample frequency and digitization method.

G. Buffer management:

In the outdoor environment, the regular vital signs are stored. Buffering data may result in a buffer run over due to capacity restrictions. This may lead to data loss or temporal application termination [9].

H. Scalability:

The architecture should balance well in terms of the number of patients and the number of sensors on each patient.

IV. WBAN ARCHITECTURE

WBAN architecture is divided into three following levels:

1. Level 1: Sensing or data collecting part.
2. Level 2: Data transmission.
3. Level 3: Data analyzing.

Figure 1 shows secure 3-level WBAN architecture for medical and non-medical applications.

A. Level 1: Sensing or data collecting part

Level 1 contains in body and on-body BAN Nodes (BNs) such as Electrocardiogram (ECG) – used to monitor electrical movement of heart, Oxygen saturation sensor (SpO2) –used to measure the level of oxygen, and Electromyography (EMG) – used to monitor muscle activity.
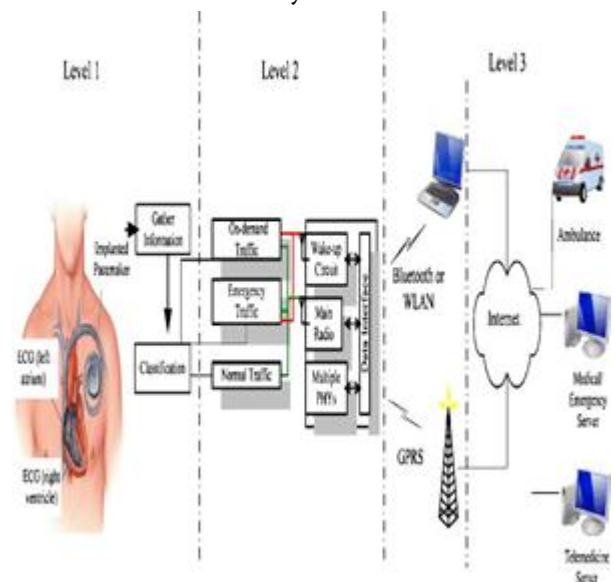
Figure 1. Architecture of WBAN

B. Level 2:Data transmission

Level 2 contains a BAN Network Coordinator (BNC) that gathers patient's vital information from the BNs and communicates with the base-station.

C. Level 3:Data analyzing

Level 3 contains a number of remote base-stations that keep patient's medical/non-medical records and

provides significant (diagnostic) recommendations. The traffic is divided into on demand, emergency, and normal traffic. On-demand traffic is processed by the BNC to obtain certain data. Emergency traffic is processed by the BNs when they exceed a predefined threshold. Normal traffic is the data traffic in a normal condition with no time critical and on-demand events.

The normal data is collected and processed by the BNC. The BNC contains a wakeup circuit, a main radio, and a security circuit, all of them connected to a data interface. The wakeup circuit is used to accommodate on-demand and emergency traffic. The security circuit is used to stop malicious interaction with a WBAN [10].

V. CONCLUSION

In this paper current research is reviewed on Wireless Body Area Network in Healthcare monitoring. WBAN is being very useful technology with many benefits for medical applications, patients and society by continuous monitoring and early detection of diseases. WBAN is the type of wireless network which consists low powered for calculating and monitoring the physiological parameters. Basically, WBAN consist the two types of sensing unit one wearable and another one is which is fixed inside the human body and after this data transmitted to the base station which is the data analyzing part.

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Impact of Granulated Blast Furnace Slag on Index Properties of Expansive Soil

Rashmi Bade, Mohd Sarosh Naim Sheikh, Pranali B. Wasnik, Abhishek R. Shahu

Department of Civil Engineering, Rashtrasant Tukadoji Maharaj Nagpur, University/ Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

Black cotton soil is an expansive soil. These are prone to large volume changes as the water content keeps on changing. Black cotton soil has low bearing capacity and high shrinkage and swelling property. These soils content the mineral montmorillonite. The expansive soil is feeble and has to improve for the construction projects. To stabilize the soil by using waste material can enhance the index properties of an unstable soil .By maintaining the proportion waste ingredient waste for an economic replacement of lavish additives such as chemical additives, using Granulated Blast Furnace Slag (GBFS) can be valuable. Granulated Blast Furnace Slag (GBFS) contain Cao (30-50 %), SiO2 (28-38%), Al2O3 (8-24%) and Mg0 (1-18%) which are acceptable for the advancement of an expansive soil. Tests are conducted for the index properties to increase the properties of soil.
Keywords: Ground Granulated Blast Furnance Slag (GGBS), montmorillonite, index properties, soil Property, Waste utilization

I. INTRODUCTION

In this quaternary time, growing population has been a great problem for making resources available.Due to which cities or town are expanding their areas where the land comprises low soil quality. Construction work cannot be carried out in such type of land. Therefore it becomes necessary to to improve the quality of soil. As per civil engineering aspect, method to improve soil is termed as **STABILISATION**. In technical terms, the process of improving soil properties by various methods with a view that the improved soil can sustain the load of whole structure is **SOIL STABILISATION**. Stabilization can be further classified into two categories i.e. Chemical and Mechanical stabilization. Now a days our society is focusing on eco friendly materials so that to reuse the waste material

.therefore aim of this project is to stabilize the soil by using waste material that is Ground Granulated Blast Furnance Slag (GGBS).GGBS is obtained by cooling molten iron slag from a blast furnance in water or steam, to manufacture a granular product that is then dried and ground into a fine powder.

II. GROUND GRANULATED BLAST FURNANCE SLAG (GGBS)

Ground Granulated Blast Furnace Slag (GGBS) is a waste product from the blast furnaces used to make iron. These functions at a temperature of about 1500 degrees centigrade and are discontented with a carefully controlled mixture of iron ore, coke and limestone.

As a result iron ore is reduced to iron and the remaining materials from a slag that floats on top of the iron. This slag is tapped off at a regular interval as a molten liquid and if it is to be used for the manufacture of GGBS it has to be rapidly cooled in large volumes of water. The cooling optimizes the cementitious properties and produces granules similar to coarse sand. This "granulated" slag is then dried and ground to a fine powder

III. CHEMICAL COMPOSITION

CHEMICAL NAME	COMPOSITION
1.Calcium Oxide (Cao)	(30-50%),
2.Silicon Dioxide (SiO$_2$)	(28-38%),
3.Aluminium oxide (Al$_2$O3)	(8-24%),
4.Magnessium oxide(MgO)	(1-18%).

IV. OBJECTIVE OF THE PROJECT

A. To determine the engineering behavior and geotechnical properties of soil with Ground Granulated Blast Furnace Slag (GGBS)
B. To increase the index properties of soil
C. To reuse the waste material Ground Granulated Blast Furnace Slag (GGBS).
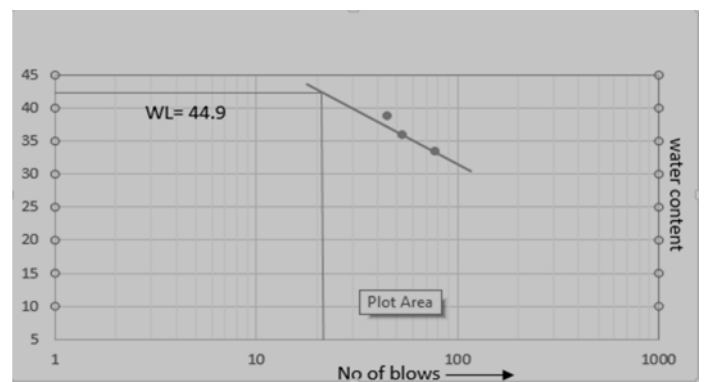
V. METHODOLOGY

The methodology carried out to achieve the objective of this Project is imparted as follows. Various experiments have to be done to determine index properties of soil. And the changes after addition of additives are also resolved.

VI. RESULTS OF UNTREATED SOIL

Sr. No	Experiment Names	Results
1	Water content of soil	40%
2	Specific gravity of soil	2.1
3	Dry density of soil	15.23
4	Liquid Limit of soil	44.9%
5	Plastic Limit of soil	14.51%
6	Plasticity Index	30.39%

Graph 1. of Liquid Limit of soil

$$PI = 30.39 > 17$$

THEREFORE IT IS CONCLUDED THAT:

1. Soil is highly plastic, highly cohesive soil.
2. Soil is not good for construction as well as foundation material.
3. Strength of soil has to be increased.
4. Ground Granulated Blast Furnace Slag (GGBS) was added with soil at proportion of 5%, 10% and 15% and the results are detailed below:

VII. V.RESULTS OF CONSISTENCY LIMITS FOR TREATED SOIL

RATIO OF ADDITIVE	LIQUID LIMIT	PLASTIC LIMIT	PLASTICIY INDEX
5%	44	19.84	24.16
10%	40.9	27.7	13.2
15%	37.3	31.74	5.56

VIII. CONCLUSION

A. Original soil was highly plastic, highly cohesive therefore additive Ground Granulated Blast Furnace Slag (GGBS) was added to soil.
B. By adding Ground Granulated Blast Furnace Slag (GGBS) GGBS the value of plasticity index of treated soil get reduced than the value of plasticity index of original soil, hence soil is modified.
C. Index properties of soil increased.
D. Modified soil can be used for construction as well as foundation material.

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Implementation of Automatic Indo-Western Commode

Deeplaxmi Rathod
Anjuman College of Engineering & Tech., Nagpur, Maharashtra, India

ABSTRACT

In today's busy life, It becomes very difficult for persons suffering from arthritis, back pain, knee pain etc. to use an Indian style commode. Due to this reason, they are left with option than using the western commode. In the purpose work, we are developing a new product prototype to cater the needs of people, who are using Indian as well as western commode this model is helpful for the elderly peoples as well as patients

Keywords : Arthritis, Indian, Western, Formatting; Style, Styling, Insert

I. INTRODUCTION

Due to modern lifestyle, most of the Indian population is suffering from diseases like arthritis, back pain, knee pain etc. specially western commode is increasing day by day. Since most of the population is not comfortable with western commode. They also need Indian style commode .but in metro cities like Mumbai, Pune, Delhi etc. where space is big problem. One cannot imagine about two separate toilet. This give us inspiration to work in this direction.

The idea is to develop an indo western commode, which will cater the needs of the people. Suffering from above mentioned issues. The proposed model is to develop an automatic indo-western commode the said commode will be operated as Indian as well as western commode the said commode will be operated as Indian as well as western commode. This model will be automatically converted to Indian style to western style and vice versa using a single switch. The automation will be implemented using microcontroller and IR sensor.

There shall be height adjustment for the commode according to the type of user there level of height adjustment will be possible i.e. low, medium, and high along with this automatic flush will also be incorporate in order to clean the commode with optional usage of water.

II. OBJECTIVE

- Comfortable for arthritis,back pain petients and old age person..
- To use less amount of water for flushing perpose..
- Height adjustable(low, medium,high).

III. METHODOLOGY

The implantation of automatic indo-western commode is proposed with automatic action of conversion of commode with the help of dc motor. The fabrication has been done by welding process.

IV. DESIGN OF AUFS

The design of automatic indo-western commode is made of following list of components.

- Resistors: 1KO, 330O, 100KO, 10O, 10KO
- Ceramic Capacitors: 0.033uF, 0.01uF, 0.047uF
- IC 7805   voltage regulator
- Atmel 89C2051 microcontroller
- DC Motor
- Sensor
- Power supply
- Fabricated metal

V. WORKPLAN

Block diagram of indo-western commode is shown in above figure. In this module we are using a combination of indo-western commode. For this module we are using microcontroller, dc motor, sensor, switches power supply and indo-western module.

Microcontroller:

In this module we are using microcontroller is ATMEL89c2051 which is used for programming the dc motor (for height adjustment). Microcontroller is also used for automatic flush system.

Dc motor:

Dc motor is used for converting the Indian commode into western commode by adjusting the seat of module i.e. (high, middle, low). Dc motor is interface with microcontroller. If microcontroller detects 1 then motor rotates clockwise direction and move upward direction and it is converted into Western commode. If microcontroller detects 0 then motor rotates anticlockwise direction andmoves downward direction and it is converted into Indian commode.

Sensor:

Here we are using infrared (IR) sensor for detecting presence of person. In manual flush system, user presses a button, which opens a flush valve allowing mains-pressure water to flow into the bowl, or sometimes the user presses directly a flush level (a handle connected to flush meter). Today, manual flush system have been replace with a sensor-operated system that automatically flushes the fixture when the user departs. The microcontroller-based automatic flush system presented here uses an infrared sensor to detect a user approaching the fixture, then it waits until the user departs. The flush system is fully controlled by a microcontroller. It also flushes before the person departs if the person is present for more than the Preset time (more than 5 minutes).

Switches:

Switches are pressed by user then microcontroller program the dc motor according to the switch pressed (either 1 or 0) and convert the commode suitable for user.

VI. PROTOTYPE IMAGE

ADVANTAGES

- ✓ Makes elimination faster, easier and more complete.
- ✓ Protects the nerves that control the prostate, bladder and uterus from becoming stretched and damaged.
- ✓ Securely seals the ileocecal valve, between the colon and the small intestine. In the conventional sitting position, this valve is unsupported and often leaks during evacuation, contaminating the small intestine.
- ✓ Relaxes the puborectalis muscle which normally chokes the rectum in order to maintain continence.

✓ A highly effective, non-invasive treatment for haemorrhoids, as shown by published clinical research.

APPLICATIONS

✓ Used in Railway, Airport, used in Hospital.
✓ Used in malls and public places.

VII.   CONCLUSION

The behind this project is to provide relief to the patients of arthritis, back pain and knee pain as well as old age persons. And because of using automatic flush there we can save wastage of water also. This project is comfortable to all the persons.

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Implementation various Modulation techniques for MIMO OFDM Systems

Neha Bodele[1], Atul Sayre[1], Palash Bawankar[1], Shejal Nandeshwar[1], Prof. Sanjay Ganar[2]
[1]B.E. Student, Department of Electronics & Telecommunication , ACET, Nagpur, Maharashtra, India
[2]Senior Professor, Department of Electronics & Telecommunication , ACET, Nagpur, Maharashtra, India

ABSTRACT

Due to the escalation in number of users, the wireless systems require tremendously high data rates and high reliability to meet the expectation. MIMO – OFDM (Multiple input and Multiple Output-Orthogonal Frequency Division Multiplexing) is being considered as an optimum solution, considering the ability to serve large number of users with a high speed communication, utilizing the bandwidth proficiently. The Multi carrier modulation provides an advantage of reduction in inter symbol interference. The efficiency of this system is subjected to vary with the channel and modulation techniques. This project is used to obtain the efficiency in terms of the Bit Error Rate performance versus Signal to Noise Ratio. In addition it includes variations based on different channels i.e. AWGN (Additive white Gaussian Noise various modulation techniques i.e. BPSK, QPSK, M-PSK, D-BPSK, DQPSK, DPSK, QAM.

Keywords: OFDM, MIMO, BPSK, QAM

I. INTRODUCTION

An overview of the basics of MIMO-OFDM technology and focuses on the BER Analysis of MIMO-OFDM systems. 3G popularly known as third generation mobile communication systems cannot meet the requirements of a variety of business types because of its low data rates. Secondly, voice transportation in 3G is conversant to second-generation (2G) communication systems because they both use circuit switching technology rather than Internet Protocol approach. Because of these limitations many countries have introduced the revolutionary,(4G) communication systems that provides a far-reaching and secure IP solution where data, voice and multimedia can be provided to users

with increased data rates than previous technologies. Communication in the wireless medium takes place through electromagnetic waves which carry the signals over the communication path. This term is mainly used in the telecommunications industry in order to refer to telecommunications systems (e.g. receivers, radio transmitters, remote controls etc.) which use energy to transfer information without the use of wires. This means the transfer of data between two or more points that are not physically connected by an electrical conductor. It can be divided into- Wireless at fixed location, portable locations and wireless in mobile applications. Cellular telephones and personal digital assistants are included under fixed and portable communication. Modulation is one of the most important process in wireless

communication, it involves varying some features of a carrier signal with the message signal which contains information to be transmitted. Fading is the change in attenuation that affects a signal over certain propagation media. Different signal copy's will experience different fading and hence will be attenuated in a different manner. Delay and phase profoundly affect the transmitted signal. This results in either constructive or destructive interference, which amplifies or attenuates the signal power seen at the receiver. Destructive interference may result in temporary failure of communication due to a severe drop in the channel's signal-to- noise ratio. OFDM is a special form of multicarrier modulation, where a single data stream is transmitted over a large number of lower rate sub-carriers.

II. MIMO OFDM

Various schemes that employ multiple antennas at the transmitter and receiver are being considered to improve the range and performance of communication systems. By far the most promising multiple antenna technology today happens to be the so called multiple-input multiple-output (MIMO) system. MIMO systems employ multiple antennas at both the transmitter and receiver
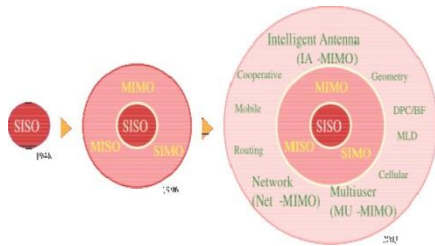
Figure 1. A sample line graph using colours which contrast well both on screen and on a black-and-white hardcopy

a. OFDM
OFDM is a multi-carrier transmission technology in which the frequency band is discrete into a number of sub channels. Usual multiplexing techniques

involve a number of filters to prevent interference among the sub-carriers and the non – overlapping must be preserved with a minimum frequency separation. On the other hand, OFDM uses signal processing techniques which thus eliminates this issue moreover, the sub- carriers are orthogonal in nature eliminating the need of many filters.

An OFDM system consists of a transmitter and a receiver. The signal is mapped in to a suitable constellation by the different modulation techniques. This serial data is then converted into parallel data stream, to which ofdm is performed. It consists of N sub carriers which carries the symbols. An OFDM transmitter involves an IFFT block

$$f(n) = \sum_{k=0}^{N-1} F(k) exp\left(\frac{j2\pi kn}{N}\right)$$
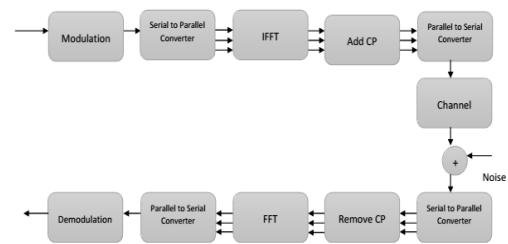
Figure 2. Ofdm Model

Cyclic prefix is added to the output to reduce ISI. This is then processed to a serial output which is passed through the corresponding channel.

At the receiver the data is converted into parallel input and the cyclic prefix is removed. This is then subjected to FFT. The frequency domain signal in kth receiving subcarrier is expressed as

$$F(K) = \sum_{n=0}^{N-1} f(n) exp\left(\frac{-j2\pi kn}{N}\right)$$

b. MIMO system model
Multiple antennas are present in both the transmitting and receiving end, thus ensures

increased channel capacity. However, the capacity is limited to the correlation of the sub channels in non-scattering environments. A path / channel is established between each transmitting antenna and receiving antenna. The signal with highest efficiency at any receiver is taken. The MIMO is used in wireless networks, cellular networks, WiMAX. The proposed system is a combination of
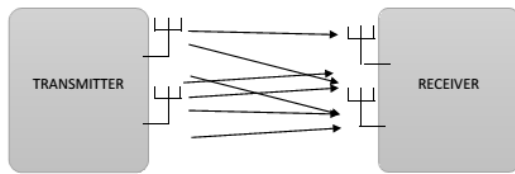
Figure 3. MIMO MODEL

c. MIMO-OFDM.
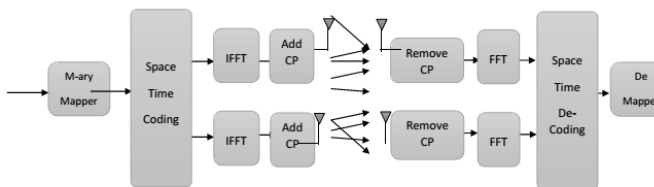
Figure 4. Mimo Model

The implemented involves MIMO-OFDM and a comparison in of different modulation schemes in various wireless channels. MIMO-OFDM is a combination of MIMO and OFDM.

Thus multiple inputs and outputs are added to the orthogonal frequency division multiplexing. Here the elimination of ISI due to signal processing , apart from eliminating the inter-symbol interference also increases the spectral efficiency enabling more number of users to share the available bandwidth. The implementation is performed using MATLAB.

III. RESULTS AND DISCUSSION

Wireless environments provides a challenging platform for maintaining good communication. The performance is mostly affected by fading (Multipath

fading and motion induced fading).In a wireless communication channel, the signal can travel in more than one path in between the transmitter and receiver. The presence of multipath components in a transmission may have variant causes including atmospheric reflection or refraction, or due to reflections from other Interfering Objects (IO) like buildings, sub channels, etc. Generally, the multipath propagation, which involves a radio channel with several IOs and a moving receiver need to resort to statistical methods rather than a deterministic description of the radio channel which is proven to be less efficient. The statistical description of the radio channels is essential for wireless communication applications. The project features the characteristics of MIMO-OFDM over AWGN.

a. AWGN CHANNEL

Additive white Gaussian noise (AWGN) channel is widely used in analysis of different modulation schemes. The channel adds a white noise to the signal passing through it. The advantage of using this channel is the absence of Fading.

The received signal is expressed as:

R (t) = s (t) + n (t)

Where s (t) is transmitted signal and n (t) is additive white Gaussian noise.
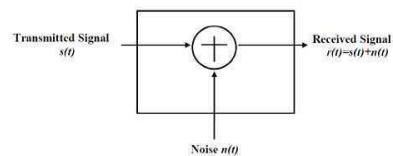
Figure 5. Awgn Channel

On applying different modulation schemes to the AWGN channel under MIMO- OFDM we observe the efficiency of the system. The simulation produces the plot of Bit Error Rate vs Signal to Noise ratio. The system with minimum bit error rate under even under low signal to ratio is considered to be efficiency. From the result it is shown that at any

instant if SNR (eg. 10 dB) the bit error rate is minimum for 256 QAM and is maximum for DQPSK. On repeating the procedure for more modulation schemes, shall produce a clear idea on the efficiency, thus enabling to choose the most optimum scheme based on the requirement.

IV. CONCLUSION

The goal of the project to obtain a performance analysis of different modulation schemes in AWGN channel for a MIMO-OFDM system is satisfied. This helped in obtaining the efficiency of the modulation techniques in terms of accuracy or reliability by plotting Bit Error Rate against Signal to Noise for a modulation scheme. This could further be enhanced by applying more modulation schemes across different wireless communication channels on a MIMO- OFDM system.
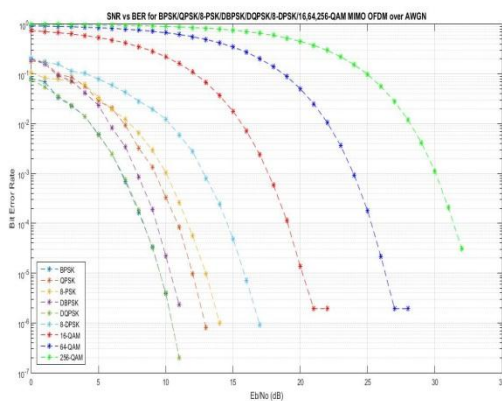
Figure 6. SNR vs BER for different modulation over AWGN

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Wireless Communication and Home Automation Using LI-FI

**Anchal Ravi Borkar[1], Priyanka Devraj Yadav[1], Mehjabeen Mehtab Khan[1], Veenatai Anil Bhaladhare[1],Prof. Dr .
Ahmed Sajjad Khan[2]**

[1]B.E Student , Department of Electronics and Telecommunication Engineering ,Anjuman College Of
Engineering, Nagpur, Maharashtra, India
[2]Professor , Department of Electronics and Telecommunication Engineering ,Anjuman College Of Engineering,
Nagpur, Maharashtra, India

ABSTRACT

This paper presents a design system implementation of new home automation system that uses Li-Fi as a
network infrastructure. This technology is based on Visible Light Communication (VLC). LI-FI is a term of one
used to describe visible light communication technology applied to high speed wireless communication. It
acquired this name due to the similarity to WI-FI, only using light instead of radio. WI-FI is great for general
wireless coverage within buildings and Li-fi is ideal for high density wireless data coverage in confined area and
for relieving radio interference issues, so the two technologies can be considered complimentary. This project
aims to demonstrate the use of Li-Fi in wireless communication and home automation.

Keywords: LED (Light Emitting Diode), Wi-Fi (Wireless Fidelity), Li-Fi (Light Fidelity), VLC (Visible Light
Communication),RF (Radio Frequency).

I.   INTRODUCTION

Light Fidelity (Li-Fi) is future technology which
replaces the Wi-Fi. Because Li-Fi overcomes
disadvantages of Wi-Fi like Data Transfer speed of Li-
Fi is more than 1Gbps while in Wi-Fi it is about 150
Mbps. Li-Fi uses light as a carrier but Wi-Fi uses
radio Spectrum. Li-Fi is a transmission of data
through illumination sending data through a LED
light bulb that varies in intensity faster than human
eye can follow. This sort of communication can be
called as Visible light communication (VLC). Using
this technique, the user can transmit the data
through light from one device to another. Li-Fi
technology works on a simple digital principle which
is nothing but led is ON a digital data 1 can

be transmitted and if it is OFF digital data 0 can be
transmitted .So, in this project work we are going to
switching the LED s very quickly .These fast
switching can be achieved by PWM technique to
transmit digital data stream containing strings. To
acquire this, we are programming the
microcontroller to vary the duty cycle of the PWM
signal which has the task of regulating the current in
the LED. The biased current is fed to LED driver unit.
The power of LED is varied according to the
waveform of data signal. At the receiver side
photodiode sensor produces a current proportional to
the received instantaneous power. From this data can
be filtered and it can be used to control application
system like fans, lamp and so on. Home automation

system can be designed and developed by using a single controller which has the ability to control and monitor different interconnected appliances such as power plugs, lights, temperature and humidity sensors, smoke, gas and fire detectors as well as emergency and security systems.

II. METHODOLOGY

Li-Fi is a Visible Light Communications (VLC) system. This means that it accommodates a photo-detector to receive light signals and a signal processing element to convert the data into 'stream-able' content. An LED light bulb is a semi-conductor light source meaning that the constant current of electricity supplied to an LED light bulb can be dipped and dimmed, up and down at extremely high speeds, without being visible to the human eye.

For example, data is fed into an LED light bulb (with signal processing technology), it then sends data (embedded in its beam) at rapid speeds to the photo-detector (photodiode).The tiny changes in the rapid dimming of LED bulbs is then converted by the 'receiver' into electrical signal. The signal is then converted back into a binary data stream that will be applied to the home appliances to switch them ON-OFF.

The Li-Fi market is projected to have a compound annual growth rate 82% from 2013 to 2018 and to be worth over $6 billion per year by 2018.Visible light communication (VLC) works by switching bulbs on and off within. The light waves cannot penetrate walls which makes a much shorter range, though more secure from hacking, relative to Wi-Fi. Direct line of sight isn't necessary for Li-Fi to transmit a signal; light reflected off the walls can achieve 70 Mbits/s.

III. BLOCK DIAGRAM

A. Working Of Transmitter:

Figure 1 shows the transmitter of wireless communication and home automation using LI-FI. It consists of microcontroller, display device, power supply and white LED as a light source. LEDs can be switched on and off to produce digital strings of different combinations of 1s and 0s.
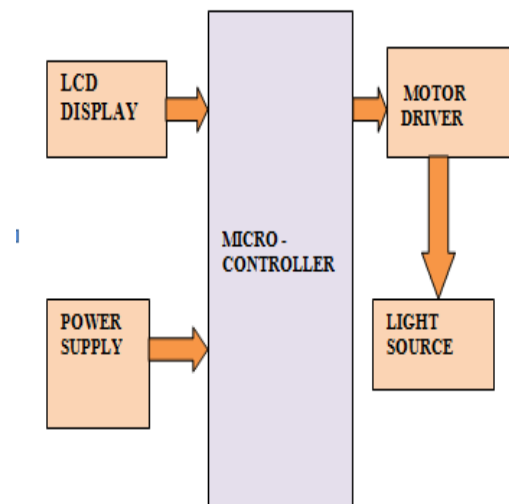
Figure 1. Transmitter Section

To produce a new data stream, data can be encoded in light by changing the flickering rate of LED. The lamp can be used as a sender or source, by transmitting the data with the LED light as signal. The LED results as a constant to the human eye by virtue of the fast flickering rate of LED. The 14 pin LCD display device is used to display the data that is being send from the transmitter in the form of characters/numbers etc. The motor driver is used here to take the low current signal from microcontroller and amplifies it into a large current that can be used to drive the relay circuit. The L293D IC receives signal from microcontroller and transmit the relative signal to the motor. It has two voltage

pins one of which is used to drawn current for working of L293D and other is used to apply voltages to the motor. The L293D switches its output signal according to the input received from microcontroller.

B. Working Of Receiver:

The receiver section consists of comparator, photo-detector, LCD Display and power supply. Light acts as a transmitting media between transmitter and receiver. The photo detector is used as a sensor. The output of the sensor is being applied to the comparator, which in turn compares the signal of the sensor to its reference voltage
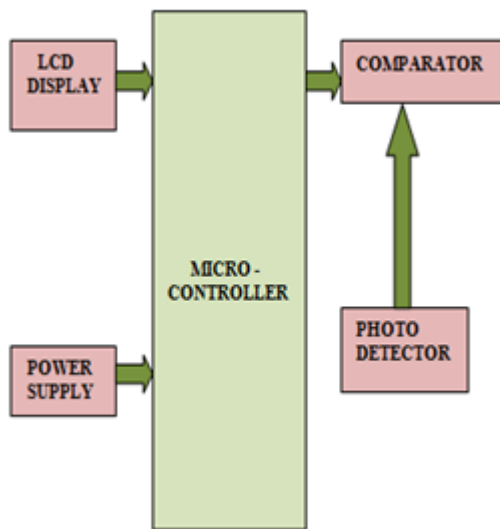
Figure 2. Receiver Section

and produces a digital binary output. The digital data is applied to the relay circuits which in turn are used to control home appliances.

IV. CONCLUSION

In conclusion, the concept of LI-FI has been introduced along with existing techniques and classical trends used for home automation purpose. This project aims to propose a cost efficient solution for wireless communication and home automation. The design guidelines and detail working of system components were thoroughly explored. In this paper the data is transfer through LI-FI. This technology is not only free to use but also safe and secure to excess.

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"Design and Fabrication of Parabolic Trough Collector"

HadiAshhar, Rahul Shrinivasan, Shubham Jaiprakash Tiwari, Wasim Ashraf, Zubair Sheikh
Mechanical Engineering, ACET, Nagpur, Maharashtra, India

ABSTRACT

An evacuated tube solar collector using therminol D-55 / Transformer oil as heat transfer fluid coupled with parabolic trough is studied in this paper. An experimental set-up is to be constructed to study the performance of evacuated tube collector with therminol D-55 / Transformer oil as heat transfer fluid. The parabolic trough is coupled with evacuated tube collector for better performance. In the traditional solar collectors water is used as heat transfer fluid. The problems in using water as heat transfer fluid are addressed in detail in this paper. The temperature characteristics of heat transfer fluid and water in the storage tank and the heating efficiency is to be determined under various conditions. The efficiency of therminol based evacuated tube collector coupled with parabolic trough is 40% more than that of water based evacuated tube collector coupled with parabolic trough. This study projects the potential of therminol based evacuated tube solar collector coupled with parabolic trough in the instant hot water generation. Also a copper coil is incorporated in the collector through which the water is passed. This setup will help in achieving higher temperature at the outlet thereby increasing the overall thermal efficiency of the PTC.
Keywords: PTC – Parabolic Trough Collector, SCM – Solar Collector Modules, SCA – Solar Collector Assembly

I. INTRODUCTION

The evacuated tube is considered to be an important component in thermal application, particularly in solar water heating systems. The performance of evacuated tube solar parabolic collectors is better when compared to flat plate collector in high temperature applications. Different parameters like optical design, optimum operating conditions, heat transfer in tubes and performance studies of solar collectors have been studied by several researchers. Extracting heat from the evacuated tube is a major difficulty in evacuated tube solar collector applications. The fluid-in-glass and fluid-in-metal are the significant designs for better performance.

Between the two, fluid-in-glass collector is widely used because of its low manufacturing cost and high thermal efficiency. Water is used as heat transfer fluid by many researchers. Morrison et al. studied the natural circulation of heat transfer fluid in fluid-in-glass evacuated tubes experimentally and numerically. Fluid-in-glass evacuated tube cannot withstand high pressures and hence it is suitable for applications where few metres of water head is available.

II. TECHNICAL SPECIFICATIONS

2.1 Parabolic Trough Collector-
A Parabolic Trough is a type of solar thermal collector that is straight in one dimension and curved

as a parabola in the other two, lined with a polished metal mirror. The sunlight which enters the mirror parallel to its plane of symmetry is focused along the focal line where objects are positioned that are intended to be heated.A parabolic trough is made of a number of solar collector modules (SCM) fixed together to move as one solar collector assembly (SCA). A SCM could have a length up to 15 metres (49 ft) or more. About a dozen or more of SCM make each SCA up to 200 metres (660 ft) length. Each SCA is an independently-tracking parabolic trough.

A SCM may be made as a single-piece parabolic mirror or assembled with a number of smaller mirrors in parallel rows. Smaller modular mirrors requires smaller machines to build the mirror, reducing cost. Cost is also reduced in case of the need of replacing a damaged mirror. Such damage may occur due to being hit by an object during bad weather.The parabolic trough reflector can generate much high temperatures more efficiently than a single flat plate collector, since the absorber surface area is much smaller. The heat transfer fluid which is usually a mixture of water and other additives or thermal oil, is pumped through the tube and absorbs the solar heat reaching temperatures of over 200 ^{0}C. The hot water is sent to a heat exchanger where it directly heats a hot water storage tank for use in the home making this type of solar heating application a closed-loop active system. However, parabolic trough reflectors use only direct solar radiation to heat the receiver tube as diffused solar radiation cannot be focused onto the absorber making them less effective when the skies are cloudy or the sun is out of alignment.

To overcome this problem, most concentrating collectors require some form of mechanical equipment that constantly orients the collectors towards the sun keeping the heat pipe absorber at the correct focal point. This is achieved by using a Tracking Solar Concentrator that aligns the trough with the sun throughout the day, maximising the solar heat gain.

The collector generally has a single rotation axis along the length of the trough which can be orientated in an east-to-west direction, tracking the sun from north to south, or orientated in a north-to-south direction and tracking the sun from east to west. Parabolic troughs are generally aligned on a north-to-south axis, and are rotated to track the sun as it moves across the sky each day from morning to night. The advantages of this type of tracking mode is that very little collector adjustment is required during the day resulting in the solar trough always facing the sun at noon time, but the collector performance early in the morning or late in the afternoon is greatly reduced due to the large incidence angles of the trough. Even though solar trough collectors use tracking systems to keep them facing the sun, they are most effective in sunnier climates where there are good solar resources. Like many other solar collectors, parabolic trough reflectors are modular, that is individual troughs can be connected together to give a larger surface area of absorber producing large amounts of solar hot water than can be created by an individual trough. Many single troughs connected together form a collector field were they are connected together in series and parallel rows.

2.2 Evacuated Tube –
The Evacuated tube collector consists of a number of rows of parallel transparent glass tubes connected to a header pipe and which are used in place of the blackened heat absorbing plate we saw in the previous flat plate collector. These glass tubes are cylindrical in shape. Evacuated tube collectors do not heat the water directly within the tubes. Instead, air

is removed or evacuated from the space between the two tubes, forming a vacuum (hence the name evacuated tubes). This vacuum acts as an insulator reducing any heat loss significantly to the surrounding atmosphere either through convection or radiation making the collector much more efficient than the internal insulating that flat plate collectors have to offer. With the assistance of this vacuum, evacuated tube collectors generally produce higher fluid temperatures than their flat plate counterparts so may become very hot in summer.

There are U-shaped copper pipes inserted in the evacuated tube with therminol—55 oil. The working fluid (in this case water) will be circulated in the copper pipes through a pump. The copper pipes will give the working fluid more time in the evacuated tube and also increases the thermal efficiency.

1. Bellow   4. Getter
2. Glass Tube (Envelope)   5. Getter Bridge
3. Absorber Tube (Pipe)
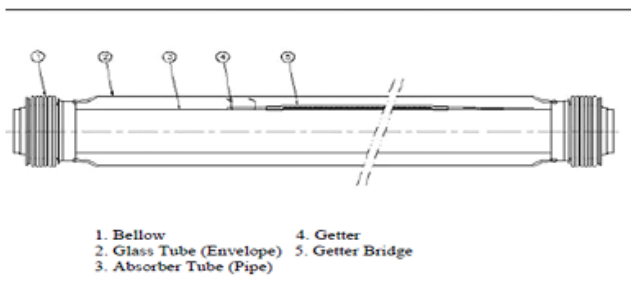
Schematic of an HCE (source: Solel Solar Systems Ltd.)

Figure 1

2.3 Therminol-55 –

Therminol 55 is a synthetic heat transfer fluid used in moderate temperature applications. Therminol 55 fluid is designed for use in non-pressurized /low-pressure, indirect heating systems. It delivers efficient, dependable, uniform process heat with no need for high pressures.
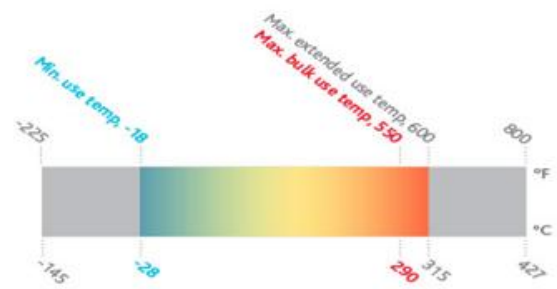
Figure 2. Temperature variation of Therminol – 55

PERFORMANCE BENEFITS –

Long Life – You will get years of reliable, cost effective performance, even when operating your system continuously at 290℃ (550°F). This means you do not have to over specify your fluid.

Excellent resistance to fouling – Because Therminol 55 is a synthetic fluid, it resists the effects of oxidation 10 times better than mineral oils. Less oxidation and solids formation. For systems without nitrogen inerting, the performance advantages are significant.

Excellent Low Temperature Pumpability – Therminol 55 is still pumpable at -28℃ (-18°F), compared to some mineral oils that will not pump at temperatures below -7℃ (20°F). With Therminol 55, your heat transfer fluid system can start-up quickly and easily.

2.4 Use Of Copper Tube -

Copper has many desirable properties for thermally efficient.First and foremost, copper is an excellent conductor of heat. This means that copper's high thermal conductivity allows heat to pass through it quickly.Other desirable properties of copper include its corrosion resistance, biofouling resistance, maximum allowable stress and internal pressure, creep rupture strength, fatigue strength, hardness, thermal expansion, specific heat, antimicrobial properties, tensile strength, yield strength, high

melting point, alloyability , ease of fabrication, and ease of joining.

Table 1. Thermal conductivity of some common metals

METAL	THERMAL CONDUCTIVITY	
	(Btu/(hr-ft-F))	(w/(m-k))
Silver	247.87	429
Copper	231	399
Gold	183	316
Aluminium	136	235
Yellow brass	69.33	120
Cast iron	46.33	80.1
Steelness steel	8.1	14.0

III. EXPERIMENT SETUP
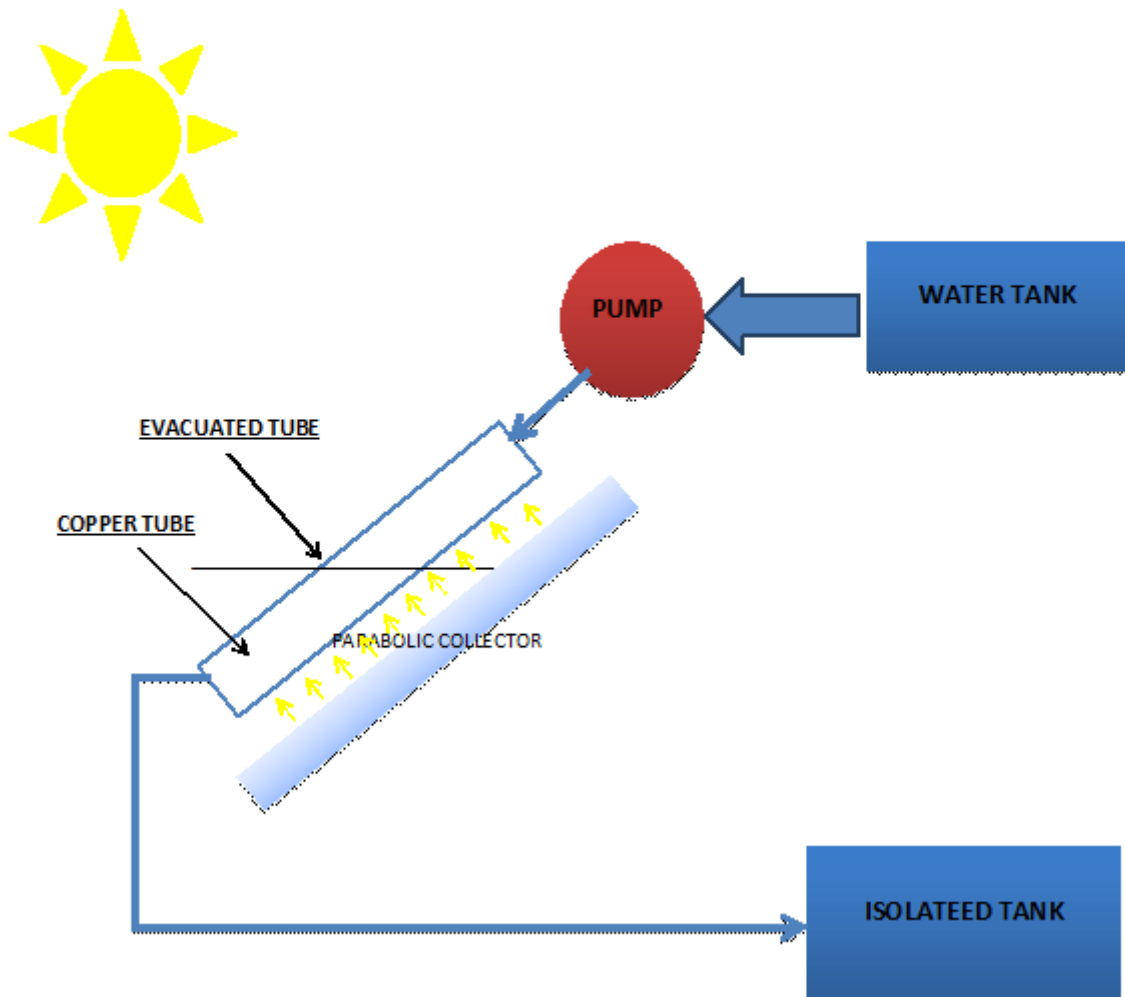
Figure 3

1. **Design Calculations -**

Equation of Parabola $\qquad$ $Y=0.041667 x^2$(in inches)

Focal point at $\qquad$ $\frac{1}{4a} = \frac{1}{4(0.041667)} = 6$ in above origin

Length of parabola from X_1 to X_2, "S"

Let t=2f and $q = \sqrt{t^2 + p^2}$, p is distance from y-axis to point X

$$S = [\frac{pq}{t} + t\ln(\frac{p+q}{t})]$$

$$p=12$$

$$t=2(6)=12$$

$$q = \sqrt{2.12^2} = 1.697 * 10^1$$

$$S = (\frac{12 + 16.97}{12} + 12\ln(\frac{12 + 16.97}{12}))$$

$$S=27.55in$$

Total length needed for sheet metal=27.55in

Trough length 42in and radius 12in

2. **Thermal Calculations –**

1. δ – Angle of Declination

2. W_s – The hour angle corresponding to sunset or sunrise

3. $\bar{S}$ – monthly average of the sunshine per hour per day at location

4. $\bar{S}_{max}$ – Monthly average of maximum possible sunshine per hour per day at location or day length on a horizontal surface.

5 .$\emptyset$ - Latitude at which parabolic collector is being placed

6. I_{sc} - The rate at which the energy is received from the sun on a unit area perpendicular to the rays of the sun at the mean distance of the sun from the earth.

3. a_1,b_1 – constants obtained by fitting data .

4. E_1 - Elevation of the location above mean sea level.

5. $\bar{H}_0$ – The monthly average of daily extraterrestrial radiation on horizontal surface at Location.

6. $\bar{H}_g$ – The monthly average of daily global radiation on a horizontal surface at a location.

a)Klen's Equation -

- Declination (δ) $=23\sin(\frac{360n}{365}+(284+n))$

$\qquad$ $= -2.42$

- $w_s= \cos^{-1}$ (-tan(latitude)* tan δ)

$\qquad$ $= \cos^{-1}(-0.387169*-0.042262)$

$\qquad$ $= 90.93^0 = 1.5870$ radians

- $\bar{S}_{max} = \frac{2}{15} w_s = \frac{2}{15}\cos^{-1}(-\tan\emptyset. \tan \delta)$

$\qquad$ $= 12.12$ hours

- $\bar{S}/\bar{S}_{max} = 0.62$

Therefore, $\bar{S} = 7.6$ hrs

- $\overline{H}_0 = \frac{24}{\pi} * I_{sc} *(1+0.33(\frac{360n}{365}))*w_s \sin\emptyset \sin \delta + \cos\emptyset\cos \delta \sin w_s$

  $= 34429.24$ kJ/m²day

- $\overline{H}_g/\overline{H}_0 = 0.4774$

  Therefore, $\overline{H}_g = 16436.519$ kJ/m²day

b) Gopinathan's Equation –

- $a_1 = -0.309 + 0.539 \cos\emptyset - 0.0693 E_1 + 0.290(\overline{S}/\overline{S}_{max})$

  $= -0.309 + 0.539\cos(21.16487) - 0.0693(0.31) + 0.290 (0.62)$

  $= 0.35956$

- $b_1 = 1.527 - 1.027 \cos \emptyset + 0.0926 E_1 - 0.359 (\overline{S}/\overline{S}_{max})$

  $= 1.527 - 1.027 \cos(21.16487) + 0.0926 (0.31) + 0.359 (0.62)$

  $= 0.375426$

- $a_1 = 0.27$; $b_1 = 0.5$ (page no.90, table 3.2)

  $\overline{H}_g/\overline{H}_0 = a+b (\overline{S}/\overline{S}_{max})$ (page no. 89)

  $= 0.27+0.5(0.62)$

  $= 0.58$

  Therefore, $\overline{H}_g = 34429.24*(0.35956+0.375426(0.62))$

  $= 20393.27$ kJ/m²day

  $= 656$ W/m²

IV. CONCLUSION

This project work focuses on enhancing the heat transfer in order to increase effectiveness of parabolic trough collector. Design calculation and experimental setup will be fabricated. Experimentation will be carried out to see the effectiveness of trough collector by use of copper tubing insert inside evacuated tube. Experimental readings will be analysed and compared with existing setup.

A Review on Pre-Heart Attack Detection Using WBAN

Prof. Khwaja Ramizuddin, Shabbir Bohra, Eshesh Mishra, Ashish Janbandhu, Shirin Sheikh
Electronics & Telecommunication, RTMNU/Anjuman College of Engineering & Tech., Nagpur, Maharashtra,
India

ABSTRACT

The remote Body Area Sensor nodes are very much affective and hence contribute to this project by making it more efficient.
The added features of low operating power and wireless communication have made the design and patient monitoring to a simplified version.
Due to its low operating power and less communication the idea of zero maintenance is deployed.
This system was developed for the earlier detection of Heart Attack in human body.
Though, numerous models were in existence, they are not practically suitable or considered hence this system is an efficient version.
Hence we have a proposed a system for Pre-Heart Attack detection of a patient. The earlier stages of heart attack include - increased heart beat rate, excessive sweating, increased blood pressure.
Keywords: Body Area Sensor, Pre-Heart Attack Detection, Sweating,Blood Pressure.

I. INTRODUCTION

Even though a person seems to be of normal health, cardiac attacks are unpredictable and require immediate attention and medication. It might be difficult and impossible to arrange for a rescue at time of emergency.

Hence we have a proposed a system for Pre-Heart Attack detection of a patient.

The earlier stages of heart attack include - increased heart beat rate, excessive sweating, increased blood pressure. With the help of piezoelectric sensor & sweat sensor, the abnormalities in a patient's body are sensed & an alert signal is sent to the caretaker, ambulance & hospital.

This helps in timely arrangement & helps in reducing the death rate due to heart attack. The sensed parameter is transmitted wirelessly making it error free, less costly as compared to other communication system.

The main advantage of our project is that here we have created a key of communication b/w patient to the nearby node. This unique key ensures that in presence of another patient no disturbance is introduced.

The Remote Body Area sensor nodes are non invasive which contributes which makes the project more efficient in prototype design. The idea of adding features of low operating power & wireless transmission makes patient monitoring simpler.

Wireless Sensor Networks (WSNs) are used for monitoring different types of parameters in various applications like environment monitoring applications e.g. checking temperature, humidity etc., habitant monitoring, combat zone, farming field checking ,air pollution monitoring, nuclear power plant observing and railway industry monitoring applications. Sensors nodes are used in wireless sensor networks for collecting the data, which are the main unit of wireless sensor networks. These sensors are placed in detecting area to screen field. WBAN is new rising subfield of WSN. The main use of WBAN is well being examination. In WBAN, remote sensors are place on the human body or fixed in the body to monitor essential signs like heartbeat rate, body temperature, etc. Utilization of WBAN innovation to monitor wellbeing parameters significantly decreases the consumptions of patient in health centre. Through the help of WBAN innovation, patients are observed at home for more periods. Sensors constantly sense information and forward to medicinal server. In WBANs, sensor hubs are worked with partial vitality source. It's needed to utilize least power for transmission information from sensing element hubs to sink. We propose a high throughput, dependable and stable directing convention for WBAN. Sensors for ECG or graphical record and Glucose level are set close to the sink. Each of these sensors have basic data of patient and required least constriction, high unwavering quality and long life thusly; these sensors dependably transmit their information specifically to sink. Different sensors take after their protector hub and transmit their information to sink through forwarder hub. It spares

vitality of hubs and system works for more periods. Mainly two varieties of devices can be distinguished: The sensors are used to measure certain parameters of the human body, either externally or internally. Examples include measuring the heartbeat, body temperature

or recording a prolonged electrocardiogram (ECG). The data is then sensed E.g., the Pulse sensor and Temperature & Humidity sensor measures the measure the heartbeat rate and temperature attached to the patient's body. Interaction with the user or other persons is usually handled by a personal device, e.g. a smart phone which acts as a sink for data of the wireless devices.

II. APPLICATION OF WBAN

The major applications are healthcare, control and automation, home and office, environmental monitoring, logistics and transportation, security and surveillance, tourism and leisure, education and training and entertainment. The BAN applications are broadly divided into following categories. Medical applications include collecting various information of a patient and forward it to a monitoring centre for further analysis. BAN can also be used to help disable people. For example, retina prosthesis chips can be implanted in the human eye to see at an adequate level. Presently BANs are widely used for entertainment purpose, which includes 3D video and Games. Further the BANs are used for sports, in which sensors in BAN can collect coordinates movements of different parts of the body and subsequently make the movement of a character in the game, e.g., moving soccer player or capturing the intensity of a ball in table tennis. Last but not the least miscellaneous applications those include forgotten things monitoring, data file transfer and social networking applications. For better functionality authors discussed about the target system that has a scalable platform that requires

minimum human interaction during setup and monitoring.

III. SYSTEM REQUIREMENT

In order to make a WBAN useful and practical, some essential requirements have to be satisfied. These requirements are strongly related to the specific application. In our case study, the WBASN architecture must satisfy the following requirements:

1. Length of monitoring:
The cardiac activity needs to be monitored for an extended period especially for aged people suffering from cardiac arrhythmia. Long-term analyses on ECGs are required to predict eventual heart attacks. The application must allow continuous monitoring.

2. Reliability:
The reliability of measurements and message delivery to healthcare professionals is necessary, due to potentially life threatening episodes.

3. Power Management:
Sensor nodes have low power capacity and are assumed to be dead when they are out of power. The system must save energy especially when the aged subject is outside.

4. Time synchronization:
Each sensor runs at its own clock and has a different sample frequency. Accordingly time synchronization between sensors is needed.

5. Message delivery:
Vital signs are delivered within a certain time determined by the level of emergency. The architecture should allow real-time delivery of emergency vital signs for both indoor and outdoor surroundings. Messages carrying emergency vital signs require least delays.

6. Frequency of signal transmission and the amount of information:
Important questions are how often data has to be transmitted and how much data. In our application the physiological data is acquired for an extended period (8 hours for example) and downloaded to the base station in real time. The system ensures periodic transmission of regular vital signs and instant transmission of urgent messages. The application data traffic is determined by the sample frequency and digitization method.

7. Buffer management:
In the outdoor environment, the regular vital signs are stored. Buffering data may result in a buffer run over due to capacity restrictions. This may lead to data loss or temporal application termination [9].

8. Scalability:
The architecture should balance well in terms of the number of patients and the number of sensors on each patient.

IV. WBAN ARCHITECTURE

WBAN architecture is divided into three following levels:

1. Level 1: Sensing or data collecting part.
2. Level 2: Data transmission.
3. Level 3: Data analyzing.

Figure 1 shows secure 3-level WBAN architecture for medical and non-medical applications.

Level 1: Sensing or data collecting part
Level 1 contains in body and on-body BAN Nodes (BNs) such as Electrocardiogram (ECG) – used to measure the heartbeat rate, temperature and humidity sensor used to measure the body temperature

Figure 1. Wban Architecture

Level 2: Data transmission

Level 2 contains a BAN Network Coordinator (BNC) that gathers patient's vital information from the BNs and communicates with the base-station.

Level 3: Data analyzing

Level 3 contains a number of remote base-stations that keep patient's medical/non-medical records and provides significant (diagnostic) recommendations. The traffic is divided into on demand, emergency, and normal traffic. On-demand traffic is processed by the BNC to obtain certain data. Emergency traffic is processed by the BNs when they exceed a predefined threshold. Normal traffic is the data traffic in a normal condition with no time critical and on-demand events.

The data is immediately sent wirelessly two patients caretaker, doctor, and ambulance.

V. CONCLUSION

In this paper current research is reviewed on Wireless Body Area Network in Healthcare monitoring. WBAN is being very useful technology with many benefits for medical applications, patients and society by continuous monitoring and early detection of diseases. Here we have overcome cross communication in case two patients (having nodes attached two there bodies) come close to each other. Through this project the data send is highly secured WBAN is the type of wireless network which consists low powered for calculating and monitoring the physiological parameters. Basically, WBAN consist the two types of sensing unit one wearable and another one is which is fixed inside the human body and after this data transmitted to the base station which is the data analyzing part.

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Intelligent Shopping Cart with Anti-Theft

Prof. Arpit Yadav, Ruchita Deshmukh, Kajal Agrawal, Snehalata Shende, Vidya Thakre, Rina Bhoyar
Department of Electronics & Telecommunication, S. B. Jain Institute of Technology Management & Research,
RTMNU, Nagpur, Maharashtra, India

ABSTRACT

Nowadays in mall for purchasing daily using products, it requires trolley. Every time customer has to do calculations of those products and need to compare it with his budget in pocket. In addition, customer has to work for selecting the right product. In addition, after that, it is hectic to stand in line for billing all the goods. Hence, we are proposing to develop a smart shopping cart system that will keep the track of purchased products and online transaction for using RFID. At billing counter the cashier prepare the bill using bar code reader which is very time consuming process and results in long queue at billing counter. This automatic billing system in the shopping mall will reduce time required for billing. The main aim of this project is to improve the quality of shopping experience to the customers.

Keywords: At mega, 16A , RFID Tags,LCD Display

I. INTRODUCTION

Now a day's interest in shopping malls is widely increasing among people. In the present shopping malls, customers find various difficulties. We spend much time in searching for our desired products and finally overall shopping process becomes more time consuming too. In this application, each item in Supermarket is tagged with a unique RFID label. Each shopping cart is designed or implemented with a Product Identification Device (PID) that contains microcontroller, LCD, an RFID reader .RFID Reader recognizes the products put in the cart. As soon as each item is placed, various information like item name, price of the product is displayed in the LCD display placed in the cart. Along with this total sum is also displayed. Therefore, this project improves the security performance and the speed.

II. METHADOLOGY

The system is having two barcode scanners placed at two different checkpoints namely entry and exit points respectively. A smart device will keep record of information of all the products that customers have purchased. The scanned products will automatically bill in wireless device for purchases and as we know, time has become money so thereby significantly, it reduces turn out time and there is no need to stand in long queue.

Figure 1. Visual Abstract of Intelligent Trolley

III. WORKING

Following flowchart will illustrate the working of this system.

Step 1: When customer enters in shopping mall, customer will be given one unique card that is Used open the shutter and initialize the system.

Step 2: Then customer has to scan the products with the help of RFID scanners and the Information regarding the products will be stored and it is done through entry side point.

Step 3: If customer's budget exceeds his pocket then he can go for his desired products. All the Information will be deleted and it is done through exit side point.

Step 4: AT mega, 16A will perform addition and subtraction of products.

Step 5: All the information regarding cost, quantity etc will be displayed on LCD screen and send To person who is sitting at counter
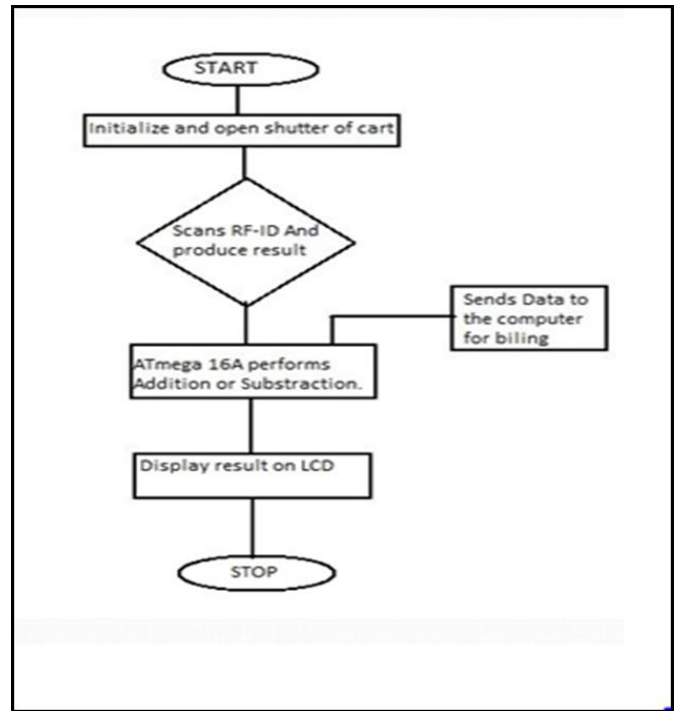
Figure 2. Flowchart

The system having following components:

RFID Tags:

RFID Reader is attached to the trolley. Whenever a customer put RFID Tag near to RFID Reader, RFID Reader detects the RFID Tag and trolley act as Smart Trolley. All this process going to works using radio frequency. Tags are of two types. Passive and Active tags. Passive tags have no battery life, and Active tags have battery life4 .Through the RFID implementation of mobile technologies and automatic recognition, technologies become easier for smart cart. With the help of wireless networks, RFID makes the conventional retail process fast, transparent and efficient.
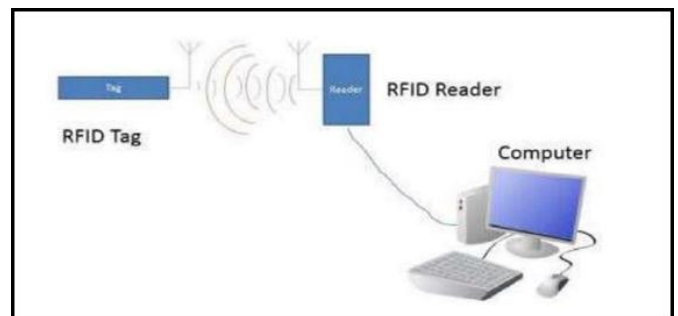
Figure 3. RFID System

AT Mega 16A:

Here we are using a very easy to use microcontroller called ATmega16A. It is a low-power CMOS 8-bit microcontroller and it is based on the AVR enhanced RISC architecture. By executing powerful instructions in a single clock cycle, the ATmega16A achieves throughputs approaching 1 MIPS per MHz allowing the system designer to optimize power consumption versus processing speed. It is the heart of the system. As it is very cheap, it makes system very efficient. It performs the function of storing the information of products.
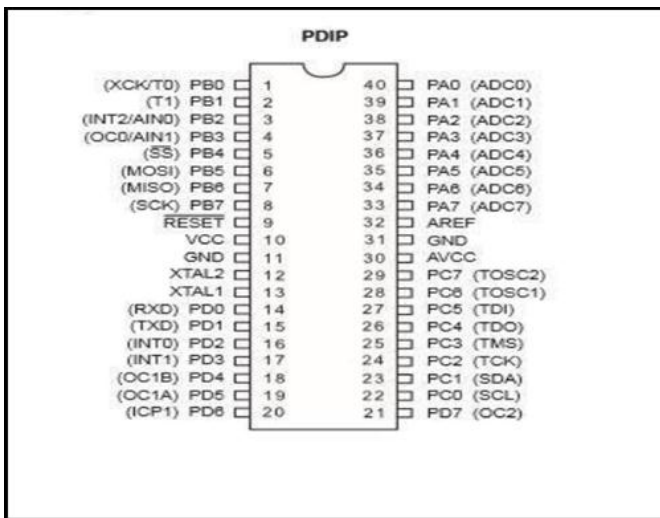
Figure 4. AT Mega 16A

LCD DISPLAY:

In this project document, we will discuss about character based LCDs, their interfacing with various microcontrollers, various interfaces (8bit/4-bit), programming, special stuff and tricks you can do with these simple looking LCDs which can give a new look to your application. Usually these days you will find single controller LCD modules are used more in the market. Therefore, in the project document, we will discuss more about the single controller LCD, the operation and everything else is same for the double controller too.

Figure 5. LCD Display

IV. ADVANTAGES

- ✓ It operates on less power and requires less space.
- ✓ It is less bulky and cheap.
- ✓ It reduces time and increases speed.
- ✓ It reduces human efforts like standing in queue.
- ✓ It is very efficient as costumer is able to balance their budget

V. FUTURE SCOPE

In this, details of products should be updated in memory unit of trolley. We take the use of IOT for updating information. It can follow the customer by making use of optical sensors, Motor, motor drivers. We will make trolley in such a way that it should make safe distance Between trolley and customer.

VI. RESULT AND CONCLUSION

In this intelligent trolley system, now there is no need for the customer to stand in queue and Scan all the products at the end. So in this way it reduces time of customer and shop owner as Well. Especially during weekends or festivals season people can return their home quickly and Enjoy with family that means there is no wastage of time in long queue. As it is very beneficial, it can attract more customers.

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Hand Gesture Based Robot Control

Ms.Ruhina Quazi[1], Manali Wani[2], Gayatri Kinkar[2], Apeksha Nagrare[2], Sohail Sheikh[2]

[1]Professor Electronics & Telecommunication, RTMNU/Anjuman College of Engineering & Tech., Nagpur,
Maharashtra, India

[2]Student,Electronics & Telecommunication, RTMNU/Anjuman College of Engineering & Tech., Nagpur,
Maharashtra, India

ABSTRACT

Now a day's human-machine moving further from mouse to pen and is becoming more compatible with the physical world. Day by day the gap between human and machine is being reduced while introducing the new technology with the standards of living in electronics world. Gesture have played vital role in diminishing this abyss. This paper deals with design and implementation of an accelerometer based hand gesture using MEMS. The identification and recognition of posture, gait and human behaviours is also the subject of gesture recognition techniques. Using the concept of gesture recognition or MEMS technology, it is possible to interact naturally without any mechanical device.

Keywords: Accelerometer, MEMS, Gesture, Microcontroller, Robotics.

I. INTRODUCTION

A gesture is a form of non-verbal communication in which visible bodily actions communicate particular messages. It comprises of sound, light variation or any type of body movement based upon the type of gestures, they have been Captured via sound, touch, optical light, bionic and Motion Technologies through still camera, data glove, Bluetooth, infrared beams etc. A hand Gesture Control Robot is a kind of robot which is controlled by the hand gestures and not by using buttons.

The robot is equipped with two sections-Transmitting section and Receiving section.

The Goal of this paper is to develop methods that helps user to control & program a robot with high level of abstraction from
robot specific language.

Microelectromechanical systems (**MEMS**) are the technology of the very small and merge at the nano-scale into nanoelectromechanical systems. MEMS are also referred to as micro machines (in Japan), or Micro Systems Technology - MST (in Europe).MEMS is an emerging technology which uses the tools and techniques that were developed for the Integrated Circuit industry to build microscopic machines. Since it is a photographic-like process, it is just as easy to build a million machines on the wafer as it would be to build just one.

II. METHODS AND MATERIAL

MEMS

Imagine a machine so small that it is imperceptible to the human eye. Imagine working machines no bigger than a grain of pollen. Imagine a world where gravity and inertia are no longer important, but atomic forces and surface science dominates. Imagine a silicon chip with thousands of microscopic mirrors working in unison, enabling the all optical network and removing the bottlenecks from the global telecommunications infrastructure. You are now entering the micro domain, a world occupied by an explosive technology known as MEMS.
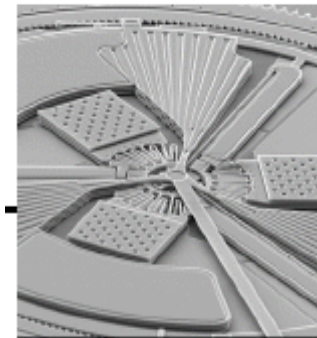
A truly amazing MEMS device. It is a sophisticated MEMS Thermal Actuator

Figure 1

Most new cars have over a dozen MEMS devices, making your car safer, more energy efficient, and more environmentally friendly. MEMS are finding their way into a variety of medical devices, and everyday consumer products.MEMS devices are manufactured using batch fabrication techniques similar to those used for integrated circuits on a small silicon chip at a relatively low cost. Sensors gather information from the environment through measuring mechanical, thermal, biological, chemical, optical, and magnetic phenomena.

We are using MEMS ADXL103/ADXL203

ADXL103/203

The ADXL103/ADXL203 are high precision, low power, complete single- and dual-axis accelerometers with signal conditioned voltage outputs, all on a single, monolithic IC.
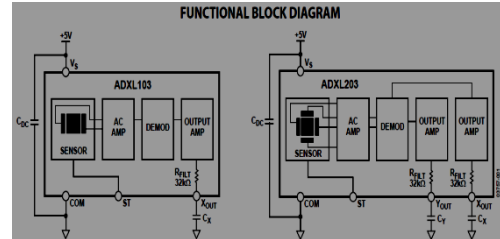
Figure 2

THEORY OF OPERATION

The ADXL103/ADXL203 is complete acceleration measurements systems on a single, monolithic IC. The ADXL103 is a single-axis accelerometer, and the ADXL203 is a dual-axis accelerometer. The ADXL103/ADXL203 is capable of measuring both positive and negative accelerations to at least ±1.7 g. The accelerometer can measure static acceleration forces such as gravity, allowing it to be used as a tilt sensor.

MOTORS

Motor is a device that creates motion, not an engine; it usually refers to either an electrical motor or an internal combustion engine. Industrial motors come in a variety of basic types. These variations are suitable for many different applications.
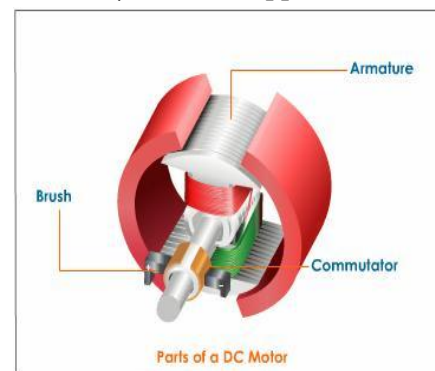
Figure 3

DC MOTOR

Working of a DC Motor

When the coil is powered, a magnetic field is generated around the armature. The left side of the armature is pushed away from the left magnet and drawn towards the right, causing rotation. When the coil turns through 90^0, the brushes lose contact with the commentators and the current stops flowing through the coil.

DC Motor Speed

Whereas the voltage polarity controls DC motor rotation, voltage magnitude controls motor speed. In other words, the higher the voltage, the quicker will the magnetic field become strong... As a result, motor speed is directly proportional to applied voltage.

Motor Speed Curve: One aspect to have in mind is that the motor speed is not entirely lineal. Each motor will have their own voltage/speed curve.
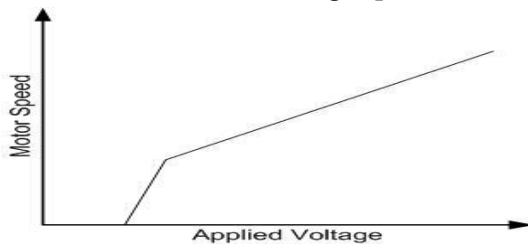
Figure 4

L293D Dual H-Bridge Motor Driver

L293D is a dual H-Bridge motor driver, L293D has output current of 600mA and peak output current of 1.2A per channel. Moreover for protection of circuit from back EMF output diodes are included within the IC. The output supply (VCC2) has a wide range from 4.5V to 36V, which has made L293D a best choice for DC motor driver.

RF COMMUNICATION:

How does an RF communication system work?

The RF communication system then utilizes this phenomenon by wiggling electrons in a specific pattern to represent information. The receiver can make this same information available at a remote location; communicating with no wires. In most wireless systems, a designer has two overriding constraints: it must operate over a certain distance (range) and transfer a certain amount of information within a time frame (data rate). Of this series, the HT12D is arranged to provide 8 address bits and 4 data bits.

THE MICROCONTROLLER: The AT89C51 is a low-power, high-performance CMOS 8-bit microcontroller with 4k bytes of Flash Programmable
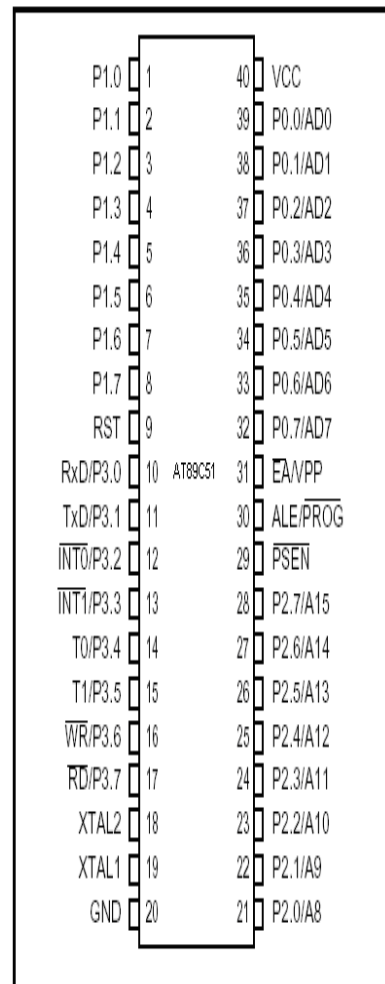
Figure 5

III. CONCLUSION

In this paper, various Methodologies have been analyzed and reviewed with their Merits and demerits under various operational and functional Strategies. Thus, it can be concluded that features like user Friendly interface, light weight and portability of android OS Based Smartphone has overtaken the sophistication of technologies like programmable glove, static cameras etc. Making them obsolete. This field have made wireless gesture controlling a ubiquitous phenomenon , it needs to acquire more focus in relevant areas of applications like home appliances, wheelchairs, artificial nurses , table top screens etc. this

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FPGA controlled Robotics Arm Using VHDL

Mohd. Shoab Sheikh*[1], Jahaara Farooqui[1], Priyanka Sangole[1], Afreen Farooqui[1], Dr. Ahmed Sajjad Khan[2]
[1]B.E Student, Department of Electronics & Communication Engineering, Acet, Sadar, Nagpur, Maharashtra,
India
[2]Associate Professor , Department of Electronics & Communication Engineering, Acet, Sadar, Nagpur,
Maharashtra, India

ABSTRACT

The purpose of this project is to design and implement a control system with an FPGA chip to control the movements of a robotic arm. The whole system is composed of the Controller System and the drive circuits, one driver circuit for each motor on the robotic arm. These drive circuits are needed because the Control System does not supply enough power to drive the motors directly. The controller System is implemented on the Spartan -II FPGA chip using VHDL code. Spartan -II FPGA is capable of running at much higher speed but a slow clock is needed to obtain relatively large delays for the output signals. This paper basically focus on the work of our project which is based on motion control using stepper motor .we have successfully done the basic part of project in which we control the stepper motor using FPGA. We have successfully done the programming and simulation part of the project. This project gives the idea regarding controlling servo and stepper motor using interfacing of ULN2803A with FPGA. Consequently, it's important to understand how to work, and what problems exist in designing effective robots. This project will address one of those problems: positional control.

Keywords: Stepper system, position control, FPGA.

I. INTRODUCTION

Robotic control is an exciting and high challenge research work in recent year. Several solutions to the implementation of digital control system for robot manipulator and mobile robots are proposed in the literatures. But, all of those techniques use the DSP chip or Microcontroller [2]. DSPs and microcontrollers can no longer keep pace with the new generation of applications that require not just higher performance but more flexibility as well –

without increasing cost and resources. We are going to design the robotic arm controller using FPGA chip. Robots are usually characterized by the design of the mechanical system. Our Robot is the jointed arm robot; our Jointed Arm robot has five rotational axes connecting rigid links and a Gripper. A Jointed Arm robot is frequently called an anthropomorphic arm because it closely resembles a human arm. Jointed Arm robots are suitable for a wide variety of industrial tasks, ranging from welding to assembly [7]. The robot consists of an

arm with six degrees of freedom. The approach for implementing control systems, Is to design specialized circuits to perform the real-time functions. The whole work follow the sequences of traditional approach basically entire system is classified in three major parts like Hardware design, Software design and Mechanical design. Arm controller robot generally consists of four major parts that is Controller, Arms, Drive Circuit and Sensors. Each motor will have its own control signal. This signal is provided from the FPGA through the drive components. With each movement the motor makes, a Shaft encoder reads the position off of a disk attached to the motor. This position information is sent back to the FPGA Controller so it knows how much farther the motor needs to be turned or if the motor has turned too for [8].
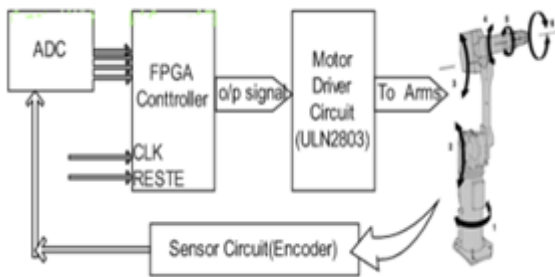
Figure 1. Overall Block Diagram

II. DESCRIPTION OF COMPONENT USED

A. CONTROLLER

We are using in our project FPGA Chip as controller. It is the heart of robot through all the motion of robot has to be control. A programmed FPGA will contain the VHDL code, which will correlate the inputs to the robotic arm movement. The FPGA system is flexible because it can be easily reconfigured by the end user and reused for many different applications of robotics [7-10].We are going to use the Spartan -IIFPGAs to control the

stepper motor with driver circuit using ULN2003A. Spartan-II FPGAs deliver the performance that allows critical control functions to be implemented in hardware rather than software. By implementing these parameters in hardware, Latency and execution time do not vary: The solution is inherently fast and deterministic. The FPGA based solution provides computation speed of the current control function well below 5 microseconds, which in turn enables high PWM carrier frequency update. The FPGA also allows the torque-control loop response to reach 5 KHz at the -3 dB point. This high-bandwidth torque control loop provides low harmonic current ripple. Interfacing with recently introduced low inductance servomotors and stepper motors such as linear motors becomes much easier [3]. FPGA and FPGA developing system are new technology for developing very large scale integrated circuit. It is known to all, coupling with the fast promotion of SRAM technology, the cost of FPGA decreases while the density increases, so it's lower cost, faster time-to-market and the flexibility make the replacement of ASIC with FPGA a new tread. FPGA has been employed in motor control and robot locomotion successfully and extensively.
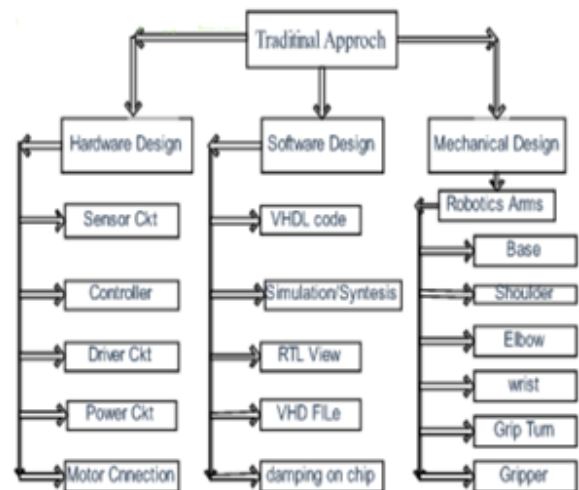
Figure 2. Traditional Approach Blocks

FPGA has flexible and programmable architecture, we can add some special needs into our controller, and as the algorithm to regulate the current in the windings of stepper motor that is always improved day by day, we can update our control algorithm and download it to the controller in time [5].The stepper motor is an electrical motor, which converts digital electric input into a rotary motion. Stepper Motor is the one that revolves through a fixed angle for each pulse applied to the logic sequences. By controlling pulse rate stepper motor speed can be controlled. Stepper Motor is also called as a Single Stack Variable Reluctance Motor [1]. The switching is carried out in a sequence; the rotor will rotate with stepped motion. If the power to winding 1 is removed and winding 2 is energized, the rotor will turn 30 degrees, or one step. To rotate the motor continuously, we just apply power to the two windings in sequence. Assuming positive logic, where a 1 means turning on the current through a motor winding, the following control sequences will spin the motor. This sequence uses more power and but produces greater torque.

Table 1.Control sequence for motor winding.

Step	Coil 1	Coil 2	Coil 3	Coil 4
1	1	0	0	0
2	0	1	0	0
3	0	0	1	0
4	0	0	0	1
5	1	0	0	0

B. DRIVE CIRCUIT SCHEMES

The stepper motor driver circuit has two major tasks: To change the current and flux direction in the phase Windings. To drive a controllable amount of current through the windings, and enabling as short current rise and fall times as

possible for good high speed performance [4]. For a given size of a stepper motor, a limited space is available for the windings. In the process of optimizing a stepper motor drive system, an efficient utilization of the available winding space as well as a matching of driver and winding parameters are of great importance. These motors move something into position and lock it there firmly. Unlike most other tools for moving things, stepper motors can tell you exactly how far and how fast they have moved, and which way they are pointing [6]. The stepper motor controller rapidly distributes precisely timed bursts of electricity to the different coils of the stepper motor and provides the timing to control the speed. It can also count the number of steps travelled-that is, how far the armature has been turned-with computer-like accuracy. The links (the sections between the joints) are moved into their desired position by the drive; a drive is powered by electric motor. The stepper motor driver receives low-level signals from the control system and converts them into electrical (step) pulses to run the motor. One step pulse is required for every step of the motor shaft.
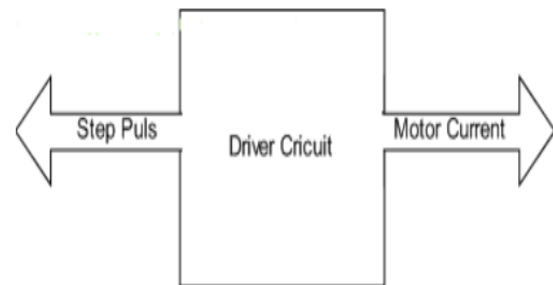
Figure 3. Block diagram of driver Circuit
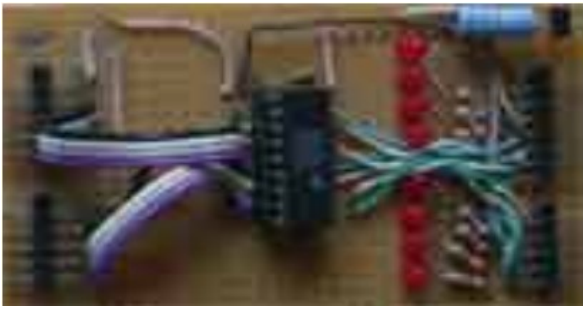
Figure 4. Stepper motor driver board

In our project we are using the stepper board consists of a ULN2803 chip. This consists of 8 Darlington's to amplify current. A total of 2 unipolar stepper motors can be controlled with this. Bellow figure 4 show the internal connection ULN2803 with Motor.
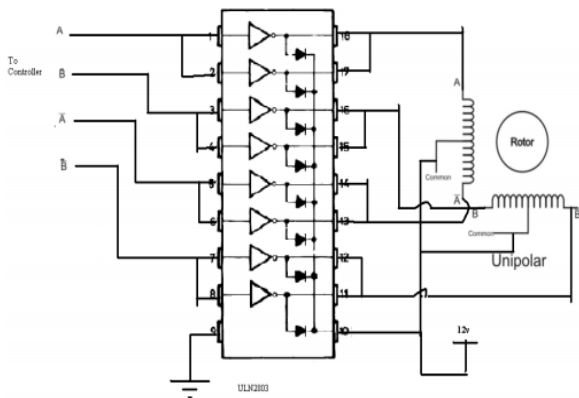
Figure 5. Interfacing of ULN2803 with motor

C. SENSOR CIRCUIT

We are going to attach the shaft encoder to motor to control the position and send the control signal to the FPGA controller, which provides automatic commutation point alignment for maximum efficiency and torque during closed-loop operation. The encoder disk is firmly connected to the back-shaft of the motor, so that both the shaft and the encoder disk rotate at the same rpm. [8]. The rotation of the motor causes the beam of light to be periodically intercepted by the solid parts of the encoder disk creating a sequence of pulses of light, which will be translated by the photo couple's

receiver into pulses of electricity [12]. Those pulses of electricity contain all the information we need to implement a closed loop control. The frequency of those pulses is directly proportional the speed of rotation of the shaft (RPM) and the number of those pulses correspond to the angular displacement of the shaft. The more the number of holes in an encoder disk, the higher will be the resolution. Given figure.7 shows the position of shaft encoder between controller and motor. The shaft encoder sensor sends information, in the form of electronic signals back to the controller through the ADC. ADC is use for the purpose of converter accuracy.
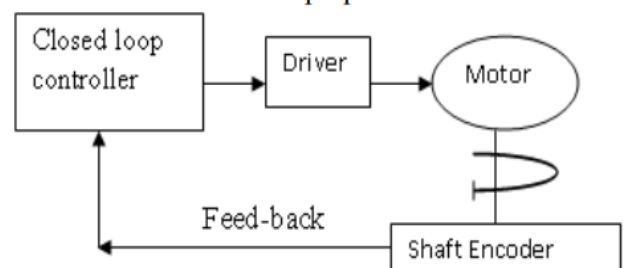
Figure 6. Position of shaft encoder

Sensors also give the robot controller information about its surroundings and let it know the exact position of the arm, or the state of the world around it [9]. As you can see in figure.7 the shaft encoder will provide the controller's internal counter with a sequence of pulses that correspond to the rotation of the motor. A timer is set to execute two software routine every 1/10th of a second. As the software routines is to recalculate the actual angle of the shaft or the total number of revolution.
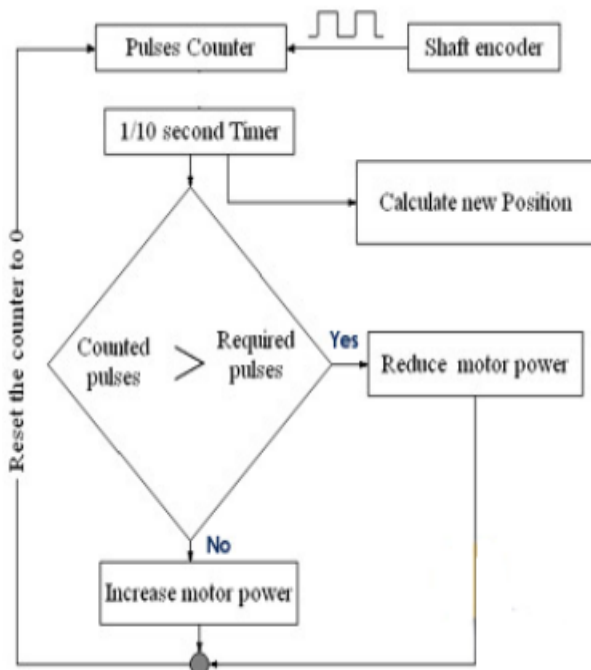
Figure 7. Operation of shaft encoder

D. ROBOTICS ARMS

The arm is the part of the robot that positions the end-effector and sensors to do their pre-programmed business. Our robot having five joint and one gripper. It is having 6 degrees of freedom to allow them to reach any possible point in space within its work envelope. Following TABLE III shows the motor sequences and motor joints. And TABLE II shows the logical sequences arms. As defined earlier there are 6 degrees of freedom to the Robot and each has two possible orientations. The control signals to the motor define the movement of these parts. Each of the joints performs 3 actions (Except the gripper) - Stay, Obtuse angle turn and acute angle turn. So two bits are required to represent each of the movement.

Table 2. logical sequences arms

F	E	D	C	B	A
00	00	00	00	00	0
01	01	01	01	01	1
10	10	10	10	10	

For the Base F:
00 => Stay (Don't move)
01 => Turn right by 45 Degrees
10 => Turn left by 45 Degrees
For the Shoulder E:
00 => Stay (Don't move)
01 => Turn down by 45 degrees (Acute angle)
10 => Turn up by 45 degrees (Obtuse angle)
For the Elbow D:
00 => Stay (Don't move)
01 => Turn down by 45 degrees (Acute angle)
10 => Turn up by 45 degrees (Obtuse angle)
For the Wrist C:
00 => Stay (Don't move)
01 => Turn down by 90 degrees.
10 => Turn up by 90 degrees.
For the Grip Turn B:
00 => Stay (Don't move)
01 => Turn down by 45 degrees (Acute angle)
10 => Turn up by 45 degrees (Obtuse angle)
For the Gripper A:
0 => Hold, 1=> Release.

Table 3. Motor and Motor joint

Motor	Motor Joint
Motor A	Grip Close
Motor B	Grip Turn
Motor C	Wrist
Motor D	Elbow
Motor E	Shoulder
Motor F	Base

III. CONCLUSION

Motor control design is tough work. This paper discussed a hardware and software code design of a Robot Arm Controller with 6 motors. Due to the system architecture, one FPGA can drive several

stepper motors simultaneously without increasing the processing time. This advantage makes the system very convenient since it allows the increase of the number of motors, simply using a larger FPGA. We can easily add the flexibility in operation by modify its behavior, changing a parallel ADC for a serial one (or vice-versa) is a minor effort in an FPGA but can be very troublesome in a software solution. Once a technology is carefully set up, we can easily apply it to different systems; we can say it is multipurpose system. We can also reuse a common controller board for many different systems. this work is very useful for new researcher to get the idea of motor control in the field of FPGA and Robot.

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Imagae Feature Based Annotation for Data Verification System

Priyanka Mankar, Shweta Meshram, Prof. Imteyaz Shahzad
Department of Computer Sci. & Engineering, Engineering, Anjuman College of Engineering & Technology
Technology Nagpur, Maharashtra, India

ABSTRACT

A face annotation has many applications the main part of based face annotation is to management of most same facial images and their weak data labels. This problem, different method are adopted. The efficiency of annotating systems are improved by using these methods. This paper proposes a review on various techniques used for detection and analysis of each technique. Combine techniques are used in retrieving facial images based on query. So it is effective to label the images with their exact names. The detected face recognition techniques can annotate the faces with exact data labels which will help to improve the detection more efficiently. For a set of semantically similar images Annotations from them. Then content-based search is performed on this set to retrieve visually similar images, annotations are mined from the data descriptions. The method is to find the face data association in images with data label. Specifically, the task of face-name association should obey the constraint face can be a data appearing in its associated a name can be given to at most one face and a face can be assigned to one name.

Keyword: Face Annotation, Content Based, face data, association.

I. INTRODUCTION

The face annotation is an important technique that to annotate facial feature images automatically. The face annotation can be useful to many Applications. The face annotation approaches are often treated as an extended face recognition issue, where different classification models are trained model-based face annotation time consuming and cost of to collect a large amount of human labelled facial images.

some studies have attempted to get a search based annotation for facial image annotation by mining to tackle the automated face annotation by

exploiting content-based image retrieval method The objective of is to assign correct data labels given query facial image[1]. It is usually time consuming and cost to collect a large amount of human data labeled training facial images. It is usually difficult to the models when new data or new persons are added, in which an retraining process is usually required. The annotation or recognition performance often poorly when the number of persons or classes is very large.

II. LITERATURE REVIEW

The investigates a framework of search-based face annotation (SBFA) by mining weakly labeled facial

images that are freely available on the World Wide Web (WWW). One challenging problem for search-based face annotation scheme is how to effectively perform annotation by exploiting the list of most similar facial images and their weak labels that are often noisy and incomplete[1]. To tackle this problem, we propose an effective unsupervised label refinement (ULR) approach for refining the labels of web facial images using machine learning techniques. We formulate the learning problem as a convex optimization and develop effective optimization algorithms to solve the large-scale learning task efficiently. To further speed up the proposed scheme, we also propose a clustering-based approximation algorithm which can improve the scalability considerably. We have conducted an extensive set of empirical studies on a large-scale web facial image tested, in which encouraging results showed that the proposed ULR algorithms can significantly boost the performance of the promising SBFA scheme.

The face annotation has many real world applications. The challenging part of search based face annotation task is management of most familiar facial images and their weak labels. To tackle this problem, different techniques are adopted. The efficiency and performance of annotating systems are improved tremendously by using these methods. Here this paper proposes a review on different techniques used for this purpose and check the pros and cons of each technique[5].

Face images that are captured by surveillance cameras usually have a very low resolution, which significantly limits the performance of face recognition systems[6]. In the past, super-resolution techniques have been proposed to increase the resolution by combining information from multiple images. These techniques use super-resolution as a preprocessing step to obtain a high-resolution image that is later passed to a face recognition system[7]. Considering that most state-of-the-art face recognition systems use an initial dimensionality reduction method, we propose to transfer the super-resolution reconstruction from pixel domain to a lower dimensional face space. Such an approach has the advantage of a significant decrease in the computational complexity of the super-resolution reconstruction. The reconstruction algorithm no longer tries to obtain a visually improved high-quality image, but instead constructs the information required by the recognition system directly in the low dimensional domain without any unnecessary overhead. In addition, we show that face-space super-resolution is more robust to registration errors and noise than pixel-domain super-resolution because of the addition of model-based constraints.

Modulus

- ✓ Database creation with image in binary bit format array
- ✓ Scanning BMP Format Reading per pixel value in RGB value
- ✓ Facial feature indexing with data label
- ✓ Similar face retrieval with value
- ✓ Detected Final output
- ✓ Refined data

III. METHODOLOGY

1. The system fed with a image.
2. Extracting facial Features
3. The important data is extracted from the sample. Using software where many algorithms are available The outcome which is a reduced set of data that represents the important features of the enrolled user's face.
4. Comparison new Templates

5. This depends on the application at hand. That identification purposes, It will be a comparison between the stored on a database.

6. Declaring a Match with data

7. The face recognition system will return a match The intervention of a human operator will be required in order to select the best fit from the candidate data.

Data labeling procedure. The procedure are compared with data labeling on spectral clustering. After initial labeling with partial clustering, The proposed labeling algorithm and spectral clustering to label the rest of the faces. We recluster label faces, then data label the cluster, which similarity variation is the lowest. proposed data labeling algorithm get higher efficiency at the beginning of data labeling,

The selection of neural network is done as it has got the unique feature of flexibility with accuracy. We can consider neural network as that student who once taught a thing never forgets to reproduce it as and when required. Face Feature Recognition has adopted the adaptive behavior of neural network, which makes the project consider Time Complexity and Space Complexity.

Human beings are gifted with a unique power of visualizing and interpreting the things. But this power is being misused sometimes or it may lead you in a state of ambiguity. It happens sometimes that criminals do change their get up to escape .we familiar with sort of event in some hijacking case or bank robbery case.

But if the power of visualizing is adopted in system, the system will not allow this to happen comes for help here. Face Feature Recognition has neural net has learning element. A face is given as input to the neural net, it matches it with faces in its databases and give output in the form as it has recognize the face and will display the personality description. This is the core of the thesis. While giving the face as input few initial arrangements has to be carried out. These arrangements are listed below.

This is the method where by we traces the outline using a trace paper and a transparent paper. We take a trace paper and adjust lift over the photograph then using a sharp pencil, and good lighting, we trace out the outline of the photograph on the trace paper. Similarly, we take out 3-4 traces till we get trace as per the actual photograph. This face is then forwarded to the next module after thinning. This is totally software approach. Here, we have the scanned image in BMP format inside profile. The first job to skip the header. Now, the pointer points to pixel info. This file is now scanned left to right and RGB values are extracted. If RGB value of two consecutive pixels is found to have difference greater than a given value, it is taken into accounts, and is displayed on screen. Otherwise, we move to scan next pixel in sequence without displaying anything. Once we have scanned in left to right fashion, now to scan in top to bottom fashion. Here, again RGB values of pixels are extracted. If the difference is above taken value, the pixel is displayed at its x-y co-ordinate position on screen; else we neglect the pixel. This is continued till whole image is scanned.
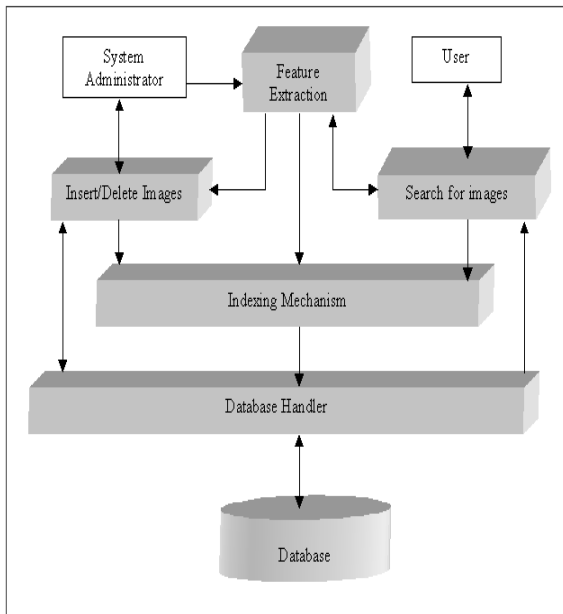
Figure 1. Data flow diagram

IV. FACIAL FEATURES

This phase is one of the most vital phase of the project. The outline profile of the end view of human face pattern yields the best descriminant features for identification of human face. This involves the following steps: -

1) Binarizing the digitized photograph.
2) Reduction of the binarized photograph to line profile.The ultimate output of this phase is ten facial features, which is necessary and enough to make neural network recognize the human face.

If we look at the side profile of the human face, we find that certain points can be readily defined on the face profile. If these points can be correctly identified they can help in extracting certain characteristics features for that particular face. Ten such points are shown in figure   .Out of these ten points, eight points are independent of each other but point 3 and 2 are interrelated with each other. All these points are calculated by using some

mathematical relationship logic along with some statistical knowledge Now, this image can be used to extract the ten points. The ten points and the methods to extract them is as follows:

A) Nose Point (Point1): This point is the most important of all the points. Nose point forms the basis for the computation of all the other fiducial points. The other can be calculated using certain mathematical logic and available formulas only after finding nose points. To find the nose point the logic to be applied is that, the first point obtained as we scan left to right, the input photograph in side profile is considered as the nose point.

B) Chin Point (Point2): This is the second fiducial point, which is to be calculated after the calculation of nose point. To find the chin point, all the pixels below the nose point, in the side profile of the input human face are joined with the nose point and whichever pixel is making the largest angle is being considered as the chin point.
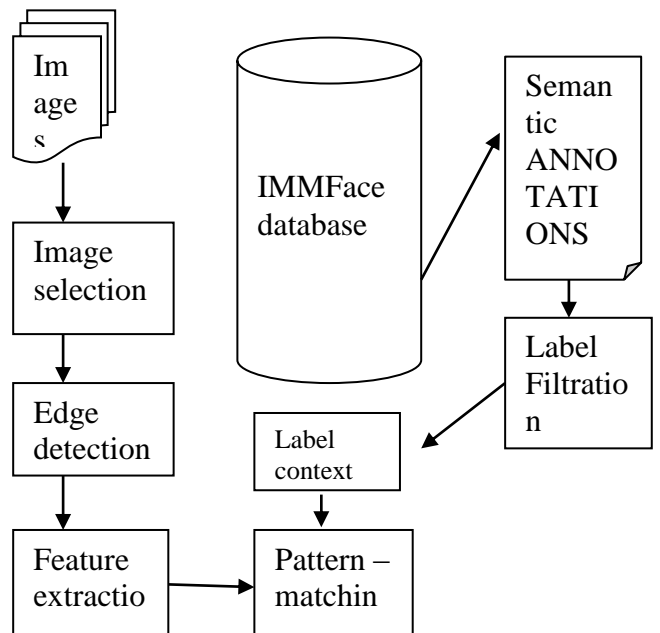
Figure 2. Process Flow

V. CONCLUSION

The face annotation on labeled images. So research works and new methods are being proposed. The research in this field importance as it is very useful in searching and social Media. The future work will work on multi person data task and thereby efficiency and accuracy of result. If the techniques are implemented properly, then the data label problem will be solved.

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Improving Power Quality of Distribution Grid by Using Ultra Capacitor

Zarmin Khwaja*, Farheen Zahra, Ibrahim Sheikh, Chandrashekhar Deshmukh, Sweta Sahare, Sumraan Sethiya, Diksha Pardi, Ruhi Sheikh

Department of Electrical Engineering, Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

Integration of Energy storage technologies into the power grid is slowly becoming a reality. So there is an increase in power quality problems on the grid. In order to improve the power quality of the distribution grid, an ultra-capacitor (UCAP) is proposed in this paper. UCAP have high power density and low energy density ideal characteristics for compensation of voltage sag and swell which are both high power and low energy event. The proposed paper integrates UCAP into dc-link of the power conditioner through a bidirectional dc–dc converter that helps in providing a stiff dc-link voltage. The simulation model of the overall system is developed and compared with the previous published work.

Keywords: Dynamic voltage restorer (DVR), Active power filter (APF), digital signal processor (DSP), ultra capacitors (UCAP), DC-DC Convertor.

I. INTRODUCTION

POWER QUALITY is major cause of concern in the industry, and it is important to maintain good power quality on the grid. Therefore, there is renewed interest in power quality products like the dynamic voltage restorer (DVR) and active power filter (APF). DVR prevents sensitive loads from experiencing voltage sags/swells and APF prevents the grid from supplying no sinusoidal currents when the load is nonlinear. The concept of integrating the DVR and APF through a back–back inverter topology was first introduced in and the topology was named as unified power quality conditioner (UPQC). The design goal of the traditional UPQC was limited to improve the power quality of the distribution grid by being able to provide sag, swell, and harmonic current compensation. In this paper, energy storage integration into the power conditioner topology is being proposed, which will allow the integrated system to provide additional functionality. With the increase in penetration of the distribution energy resources (DERs) like wind, solar, and plug-in hybrid electric vehicles (PHEVs), there is a corresponding increase in the power quality problems and intermittencies on the distribution grid in the seconds to minutes time scale . Energy storage integration with DERs is a potential solution, which will increase the reliability of the DERs by reducing the intermittencies and also aid in tackling some of the power quality problems on

the distribution grid. Applications where energy storage integration will improve the functionality are being identified, and efforts are being made to make energy storage integration commercially viable on a large scale. Smoothing of DERs is one application where energy storage integration and optimal control play an important role.

Of all the rechargeable energy storage technologies superconducting magnet energy storage (SMES), flywheel energy storage system (FESS), battery energy storage system (BESS), and ultra-capacitors (UCAPs), UCAPs are ideal for providing active power support for events on the distribution grid which require active power support in the seconds to minutes time scale like voltage sags/swells, active/reactive power support, and renewable intermittency smoothing.

In this project, UCAP-based energy storage integration through a power conditioner into the distribution grid is proposed. The organization of this document is as follows. In Section 2 gives Methods and Material of proposed system. In Section 3 Result and Discussion in which result are discussed.

II. METHODS AND MATERIAL
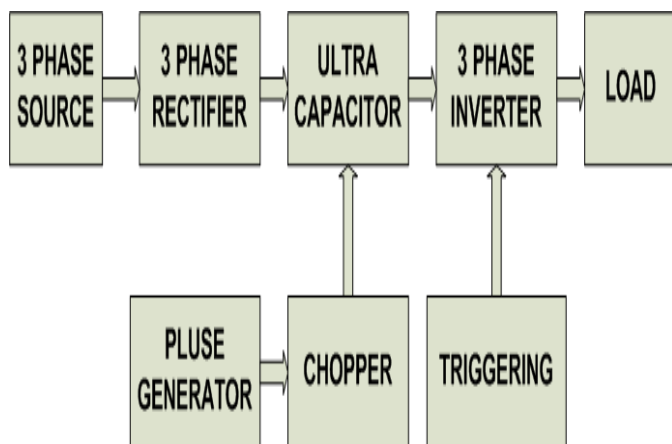
Figure 1. Block Diagram of Proposed System

The power stage consists of two back-to-back three-phase voltage source inverters connected through a dc-link capacitor. UCAP energy storage is connected to the dc-link capacitor through a bidirectional dc–dc converter. The series inverter is responsible for compensating the voltage sags and swells; and the shunt inverter is responsible for active/reactive power support and renewable intermittency smoothing.

The one-line diagram of the system is shown in Fig. 1. The power stage consists of two back-to-back three-phase voltage source inverters connected through a dc-link capacitor. UCAP energy storage is connected to the dc-link capacitor through a bidirectional dc–dc converter. The series inverter is responsible for compensating the voltage sags and swells; and the shunt inverter is responsible for active/reactive power support and renewable intermittency smoothing. The complete circuit diagram of the series DVR, shunt APF, and the bidirectional DC– dc converter is shown in Fig. 2. Both the inverter systems consist of IGBT module, its gate-driver, LC filter, and an isolation transformer. The dc-link voltage V_{dc} is regulated at 260 V for optimum voltage and current compensation of the converter and the line–line voltage V_{ab} is 208 V. The goal of this project is to provide the integrated power conditioner and UCAP system with active power capability

1) To compensate temporary voltage sag (0.1–0.9 p.u.) and swell (1.1–1.2 p.u.), which last from 3 s to 1 min.
2) To provide active/reactive support and renewable intermittency smoothing, this is in the seconds to minutes time scale.
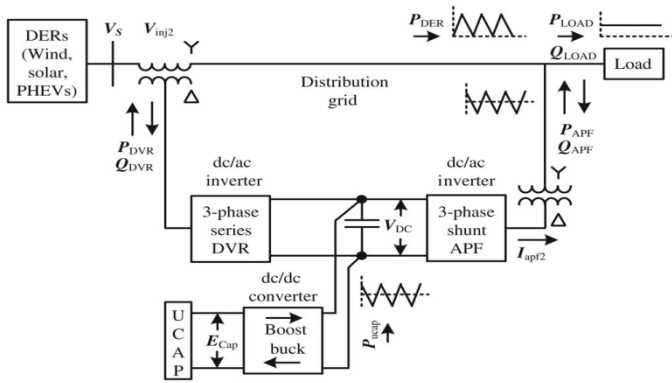
Figure 2. One-line diagram of power conditioner with UCAP energy storage
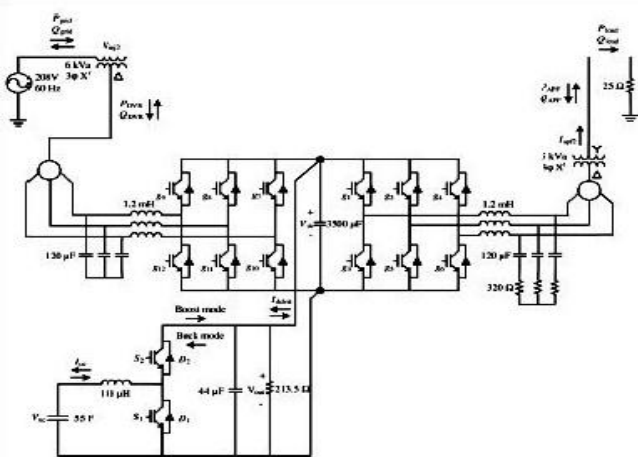
Figure 3. Model of power conditioner with UCAP energy storage

III. RESULTS AND DISCUSSION

The simulation of the proposed UCAP-integrated IVDFC system is carried out in MATLAB for a 208 V, 60-Hz system where208 V is 1 p.u. The system response for a three-phase voltage sag, which lasts for 0.1 s and has a depth of 0.84 p.u., is shown. It can be observed from that during voltage sag, the source voltage Vs rms is reduced to 0.16 p.u. while the load voltage VL rms is maintained constant at around0.9 p.u. due to voltages injected in-phase by the series inverter. This can also be observed from the plots of the line–line source voltage, the line–line load voltages and the line–neutral injected voltages of the series inverter [Vinj2a, Vinj2b,

Vinj2c]. Finally, it can be observed from that Vinj2alags Vsab by 30◦, which indicates that it is in-phase with the line–neutral source voltage Vsa. In , plots of the bidirectional dc–dc converter are presented and it can be observed that the dc-link voltage Vfdc is regulated at 260 V, the average dc-link current Idclnkav and the average UCAP current I UCAP increase to provide the active power required by the load during the sag. Although the UCAP is discharging, the change in the UCAP voltage Ecap is not visible in this case due to the short duration of the simulation, which is due to limitations in MATLAB software. It can also be observed from the various active power plots shown where the power supplied to the load Pload remains constant even during the voltage sag when the grid power Pgrid is decreasing. The active power elicit of the grid is met by the inverter power Pinsssv, which is almost equal to the input power to the inverter Pdc_n available from the UCAP. Therefore, it can be concluded from the plots that the active power deficit between the grid and the load during the voltage sag event is being met by the integrated UCAP-DVR system through the bidirectional dc–dc converter and the inverter.
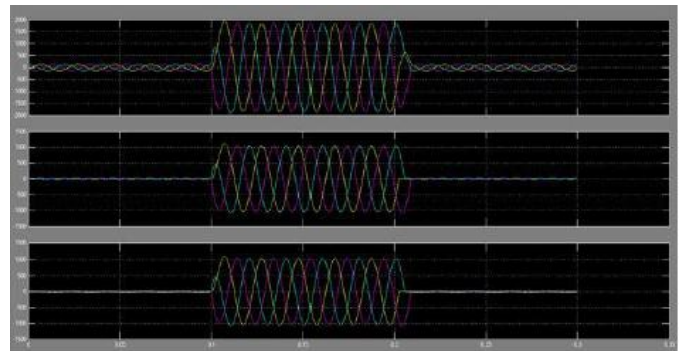
Figure 5. Voltage sag and swell
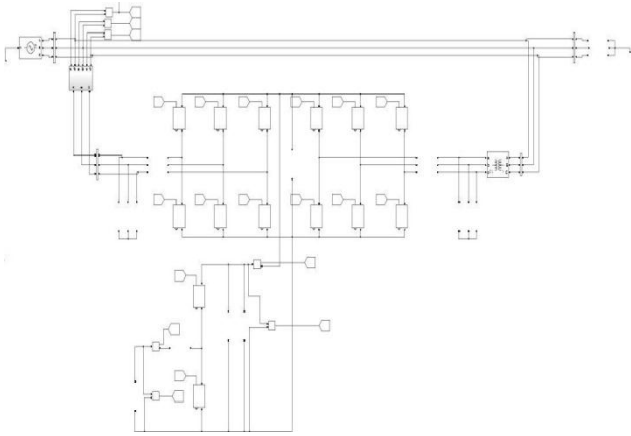
Figure 6. MATLAB Simulation of Proposed System

IV. CONCLUSION

In this paper, the concept of integrating UCAP-based rechargeable energy storage to a power conditioner system to improve the power quality of the distribution grid is presented. With this integration, the DVR portion of the power conditioner will be able to independently compensate voltage sags and swells and the APF portion of the power conditioner will be able to provide active/reactive power support and renewable intermittency smoothing to the distribution grid. UCAP integration through a bidirectional dc–dc converter at the dc-link of the power conditioner is proposed. Designs of major components in the power stage of the bidirectional dc–dc converter are discussed. Average current mode control is used to regulate the output voltage of the dc–dc converter due to its inherently stable characteristic. A higher level integrated controller that takes decisions based on the system parameters provides inputs to the inverters and dc–dc converter controllers to carry out their control actions. The simulation of the UCAP-PC system is carried out using MATLAB. Hardware experimental setup of the integrated system is presented and the ability to provide temporary voltage sag compensation and active/reactive power

support and renewable intermittency smoothing to the distribution grid is tested Similar UCAP based energy storages can be deployed in the future in a micro grid or a low-voltage distribution grid to respond to dynamic changes in the voltage profiles and power profiles on the distribution grid.

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IoT Based Energy Meter with Tampering Detection and Power Saving

Prashant K. Mohitkar, Gauri Shende, Yamini Sawarkar, Komal Rehapade, Anushree Dhakate
K.D.K. College of Engineering, Nagpur, Maharashtra, India

ABSTRACT

The IoT based Smart and many function Energy Meter for Automatic Meter Reading using Arduino kit. It has provision of connecting with Central database maintained by energy provider using computing as well as Tampering detection of energy meters. which can prevent theft detection from unregisterd users saving losses due to it. Remarkable feature of this meter is Internet of Things based implementation According to the market requirements of Arduino Meter there is use for smart. Arduino Meter. Nowadays the system will use Wireless system for communication protocol. The Wireless is used since the application need high speed data rate, need to be less powered with low cost. In this paper presenting the remote wireless Arduino Meter Reading System. This is to resolving the shortcomings of the technology of the traditional Arduino Meter Reading, by combining the characteristics of the Wireless technology and with Microcontroller ATMega16. The hardware implementation was designed, and then analyzed the use cases for Arduino Meter. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources. It requires so many workers, one set of workers to note down the reading and other set to cut the power if the payment is not paid at the right time.

Keywords: Arduino, Microcontroller, Internet Of Things. Etc.

I. INTRODUCTION

In the Internet of Things, many of the living and non-living things that encompass us will be on the internet in one form or another. Driven by the popularity of gadgets empowered by wire-less technological innovation such as Wireless Bluetooth, Radio Frequency Identification, Wireless-Fidelity, embedded sensor, IoT has moved out from its beginning stage and it is actually on the edge of changing the present fixed inter-net into a well featured upcoming Internet. Currently there are almost nine billion inter-connected gadgets and

it is estimated to touch almost fifty billion gadgets by 2020. Today the world is facing such an environment that offers challenges. Energy crisis is the main problem faced by our society. A relevant system to control and monitor the power usage is one of the solutions for this problem. One approach through which today's energy crisis can be addressed is through the reduction of power usage in households. The consumers are increasing rapidly and also burden on electricity offering divisions is sharply increasing. The consumers must be facilitated by giving them an ideal solution Embedded systems and Real Time Operating

systems (RTOS) are two among the several technologies that will play a major role in making these concepts possible [2]. A large number of people are already depending on operating systems for real time applications, these 'eyes in the sky' are now going to make an impact on our everyday s in a more significant manner. Embedded systems are pre-designed without connections and operate as per the required task. But in operating systems instruction is design-oriented. These systems are basically platform-less systems. Embedded systems are the unsung heroes of much of the technology we use today the video game we play, or the CD player or the washing machines we use employ them. Without an embedded system we would not even be able to go online using modem Almost every car that rolls off the production line these days makes use of embedded technology in one form or the other; most of the embedded systems in automobiles are rugged in nature, as most of these systems are made up of a single chip. No driver clashes or 'systems busy' conditions happen in these systems. Their compact profiles enable them to fit easily under the cramped hood of a car. These systems can be used to implement features ranging from adjustment of the suspension to suit road conditions and the octane content in the fuel to antilock braking systems (ABS) and security systems. Embedded systems are designed to do some specific task, rather than be a general-purpose computer for multiple tasks. Some also have real time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

II. LITERATURE SURVEY

1. **Dong Chen, Student Member, IEEE, Sandeep Kalra, Student Member, IEEE, David Irwin, Member, IEEE Prashant Shenoy, Fellow, IEEE, and Jeannie Albrecht, Member, IEEE "Preventing Occupancy Detection From Smart Meters" IEEE TRANSACTIONS ON SMART GRID 2015**

Utilities are rapidly replacing existing electromechanical meters, which are read manually once a month, with smart meters that transmit a building's electricity usage every few minutes. In 2011, an estimated 493 utilities in the U.S. had collectively installed more than 37 million smart meters .Unfortunately, smart meters also indirectly leak private, and potentially valuable, information about a building's occupants' activities. To extract this information, third-party companies are now employing cloud-based, "big data" platforms to analyze smart meter data en masse. While the purpose is, ostensibly, to provide consumers energy-efficiency recommendations, companies are mining the data for any profitable insights. For example, detecting power signatures—sequences of changes in power unique to a device— for specific appliance brands could aid manufacturers in guiding their marketing campaigns, e.g., identifying homes with General Electric versus Maytag appliances . Many utilities are providing third-party companies access to troves of smart meter data. For instance, a recent report highlights one utility's practice of requiring its customers to consent to sharing their data with third parties before permitting them to use an online web portal [9]. Such privacy violations have led to a small, but growing, backlash against smart meter deployments

2. Md. Masudur Rahman; Noor-E-Jannat; Mohd. Ohidul Islam; Md. Serazus Salakin "Arduino and GSM Based Smart Energy Meter for Advanced Metering and Billing System" IEEE 2015 978-1-4673-6676-2115

Every management system is trying to make automatic, portable and remote control. This work presents a novel smart energy meter for an automatic and superior metering and billing system. The integration of the Arduino and GSM Short Message Service (SMS) provide the meter reading system with some automatic functions that are predefined. Firstly, we have simulated the project in PROTEUS 8.0 then successfully implemented on the circuit board in laboratory. The proposed energy meter system can incorporate with embedded controller and GSM modem to transmit the data like consumed energy in kWh, generated bill, security services (line Cut/On) over GSM mobile network such as data can be then fed and integrated into existing energy management systems located at power companies or organizations to provide the services among the customers without man-power. Our implemented project is able to provide all required services remotely for metering and billing with high fidelity

3. Hung-Cheng C HEN, Long-Yi CHANG National Chin-Yi University of Technology "Design and Implementation of a ZigBee-Based Wireless Automatic Meter Reading System"

ZigBee is a new global standard for wireless communications with the characteristics of low-cost, low power consumption, and low data rate. It has a good market in wireless meter reading. The design and implementation of a ZigBee-based wireless automatic meter reading system are proposed in this paper. The experimental results show that the design can meet the basic needs of automatic meter reading with flexibility and

expansibility. It can act as a platform of wireless monitor system and supplies a new hardware design approach for wireless ZigBee networks.

With the rapid development of automation and measuring techniques, automatic recording of the data in the meter reading instrument has gradually become the target of people whose working, living, and home conditions are of increasingly high level of intelligence. Meanwhile, utilities also hope that the development of new technologies to solve the problems they encountered in the practical work about cumbersome meter reading and no reliable protection of accuracy and real time; and enable both user friendly and improving public sector efficiency and management level. Existing wire-line meter reading system has a large number of risks. Wires are more complex, detrimental to adjustment and maintenance of the system. The long-term indoor and outdoor installation easily leads to aging, resulting in a risk of short circuit and breakage. For these reasons, it has become the industry very unresolved problem to design a remote meter reading system, with long-term reliance and convenient installation & maintenance, which not only read data automatically but also monitor operation status. With the development of wireless communication technology, in recent years there comes requirement for low cost equipment of wireless networking technology, called ZigBee. It is a short range, low-complexity, low cost, low power consumption, low data rate two-way wireless communication technology with high network capacity, short time delay, safety and reliance. Its main application areas include industrial controls, consumer electronics, car automation, agricultural automation, and medical equipment control. The core of this technology is established by IEEE 802.15.4 Working Group, and the ZigBee Alliance

founded in 2002 is responsible for high-level applications, interoperability testing, and marketing. Till now, the ZigBee Alliance has reached over 150 members of famous companies in the world including IBM, Ember, Mitsubishi, Motorola, and Philips, etc . Many semiconductor companies are targeting the ZigBee market. Since the standards were launched not long ago, chips in line with protocol have been available of multi-chip solution and single-chip solution. It can be expected that ZigBee will have comprehensive applications in the field of automation. The main methods of metering at home and abroad are: manual meter reading, IC Card prepaid meter, wire-line and wireless meter reading system. Manual meter reading has been for decades, but with the implementation of one home one meter, drawbacks of this method of reading are more and more, like difficult entrance to home, low efficiency of fee settlement, etc.

4. SHOEB S.SHEIKH "DESIGN AND IMPLEMENTATION OF WIRELESS AUTOMATIC METER READING SYSTEM" Department of Electronics ant Telecommunication, Nagpur University, Nagpur, Maharashtra 440030, India

Designing and implementing commercial as well as industrial systems based on Wireless communication has always been a prominent field of interest among many researchers and developers. This paper presents an implementation methodology for a wireless automatic meter reading system (WAMRS) incorporating the widely used GSM network. In many countries GSM network is widely known for its vast coverage area, cost effectiveness and also for its competitive ever growing market. Using GSM as the medium for WAMRS provides a cost-effective, wireless, always-connected, two-way data link between utility company and WAMRS, the WAMRS sends information of utility usage, power quality and outage alarm to utility company, tampering detection to the utility servers. In this paper we suggest a method where we utilize telecommunication systems for automated transmission of data to facilitate bill generation at the server end and also to the customer via SMS, Email.

The wide proliferation of wireless communication propose and explore new possibilities for the next generation Automatic Meter Reading whose goal is to help collect the meter measurement automatically and possibly send commands to the meters. Automation ranges from connecting to a meter through an interface for transmitting the meter measurements all the way from the meter to the utility company via GSM network. With the development of country's economy and the improvement of national power, the power requirement is still ever increasing due to use of improper power management systems and the conventional energy metering system. Over the past years, metering devices have gone through much improvement, and are expected to become even more sophisticated, offering more and more services. Meters in the past, and today in a few countries, were electromechanical devices with poor accuracy and lack of configurability. Theft detection was also a challenge. Such meters are limited to providing the amount of energy consumption on site. Recent developments in this direction seem to provide opportunities in implementing energy efficient metering technologies that are more precise and accurate, error free, etc. The implementation of WAMRS provides with many vital features as compared with the analog utility meter reading with man power. Some of these features are listed below,

1. Higher speed.
2. Improved load profile.
3. Automatic billing invoice.
4. Real time energy cost.
5. Load management.
6. Alarm warning.
7. Remote power switches on/off.
8. Tamper detection.
9. Bundling with water and gas.

WAMRS provides a two way communication between the Energy company and the load by sending in a lot of power parameters and control signal to reach the goal of load management and power demand control. Using WAMRS on distribution automation can supply many capabilities such as efficient meter-reading, distribution, power monitoring and control, load management and time-of-use rate. With rapid growth of mobile communication network, future application service will gradually concentrate on data transmission service

5. **Pooja D Talwar , Prof. S B Kulkarni "IOT BASED ENERGY METER READING" International Journal of Recent Trends in Engineering & Research (IJRTER) Volume 02, Issue 06; June - 2016 [ISSN: 2455-1457]**

The internet of thing allows object to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer based systems, and resulting in improved efficiency, accuracy and economic benefit. The increasing generation needs empowered gadgets by wireless technology which includes Bluetooth, Radio Frequency Identification, Embedded sensors and many more. In that IOT technology has grown from its beginning and now presently widely using it. The electricity plays an important role in our life. Now days as the consumers are increasing rapidly it became very hard to handle the electricity requirements. Without electricity it's impossible to survive and also it is important to save the electricity loss. As the generation is increases the consumer's requirements also increasing so in accordance with it the technology improvement is needed. So we developed the system with faster and improved technology i.e. IOT. The electricity also contains some issues like power theft. Power theft is a measure crime and it also directly affects the economy of our country. Transmission, generation and distribution of electricity include the loss of electricity. To avoid the losses we need to monitor the power consumption and losses, so that we can efficiently utilize the generated power. Meter tempering is part of power theft and also illegal crime which we can minimize. Billing is a process in general the human operator goes to every consumer's home then providing bill it will take lot of time. To resolve these issues we developed system on the base of IOT energy meter reading. IOT based energy meter reading consists of three parts: Controller, Theft detection and WIFI part. Controller part plays a major role in the system. Where all the information can send through this controller to the other part of the system and it also stores the information in it. WIFI part performs IOT operation in accordance with the Arduino controller. The energy meter connected with theft detection part if any temper happens it will send the information to the company as well as it will take automatic action by making power off.

6. **Darshan Iyer N, Dr. K A Radhakrishna Rao "IoT Based Electricity Energy Meter Reading, Theft Detection and Disconnection using PLC modem and Power optimization" DOI: 10.15662/ijareeie.2015.0407113**

The Buyer needs to pay for the usage of electricity on schedule, in case that he couldn't pay, the electricity transmission can be turned off autonomously from the distant server. The user can monitor the energy consumption in units from a webpage by providing device IP address. Theft detection unit connected to energy meter will notify company side when meter tampering occurs in energy meter and it will send theft detect information through modem and theft detected will be displayed on the terminal window of the company side. Wi-Fi unit performs the IoT operation by sending energy meter data to web page which can be accessed through IP address. The Hardware interface circuit consists of PIC18F46k22 Microcontroller, MAX232, LCD display, theft detection unit, Triac switch circuit, DB18B20 temperature sensor, PIR sensor, PLC modem, and ESP8266 Wi-Fi module. Wi-Fi unit performs the IoT operation by sending energy meter data to web page which can be accessed through IP address.

III. MOTIVATION

Stands for **metering M**eter **R**eading. A device which remotely obtain meter readings and transmits this data to the system's computer via communication media such as (RF communication module) or dedicated cables for processing. devices can detect outages, remotely connect and disconnect services, detects tampering as well as other uses. has benefits include increased cash flow, lower labor and equipment cost, increased accuracy and lower costs. Some customer satisfaction benefits include improved service quality, more customer choices and faster response time. If Home occupancy is monitored by tech savy persons, then it will be detrimental from consumer side. So, this problem motivates us to avoid this problem with our proposed system. It very difficult for energy provider company to maintain records of their consumers terms of hourly consumptions of electricity. So, it motivates us to build single Centralized database that can maintain records of their consumers electrical energy consumption hourly basis and on the analysis of that home occupancy detection can be avoided, It has become trend to integrate automatic systems via wireless applications over network which motivates us to do further advancement in this regard. Along with advancement of technology of development, research on wireless applications and remote control has become popular today. An electricity meter, electric meter or energy meter is a device that measures the amount of electric energy consumed by residence, business, or electrically powered device. So, by making it tampering proof, large amount of unwanted losses to MSEB as well as nation can be controlled. Theft detection of Electrical Energy can also be monitored through our proposed system. There is huge loss occurs to Energy provider company because of unwanted theft of electrical energy which motive us to do something in this regard. With the help of centralized database, we can monitor energy consumption of user, Technological advantages in IT infrastructure services make automated billing and paying of bills easier.

IV. RESEARCH ANAYLSIS

With the increasing population, residential, commercial, and industrial area, the consumption of electricity or utilization of power increases much rapid than the user numbers due to technologies and power dependent equipment and systems. It has now become imperative for utility companies to devise better, non intrusive, environmentally-safe techniques of gauging utilities' consumption so that the correct bills can be generated and invoices. The

benefit goes beyond the power consumption. It will also be the basis for power generation and more accurate demand forecasts which will lead to more efficient usage power distribution, power generation and minimizing raw material waste.

The smart metering system is designed to make the prevailing electricity billing system simpler and efficient. The conventional metering system is done manually. An worker of the Electricity Board will be coming to take the reading and enter in the card. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources. It requires so many workers, one set of workers to note down the reading and other set to cut the power if the payment is not paid at the right time and we have very poor servicing. Manual reading can create errors in calculation. Sometimes it happens that images taken by meter reader are not in proper manner, which leads to improper calculation of bills. This problem can be avoided with our proposed project. If bill amount is not paid by the user within specified time duration, it takes time by MSEB employee to go to that particular house and disconnect the meter until bill is not paid by the consumer. This is time-consuming task, which can be overcome by our proposed system.

We are going to achieve following objectives which are further divided into two sections.

Electrical Company Benefits:-
- To implement smart automated processes instead of manual work.
- To provide Accurate information from the network load to optimize maintenance and investments.
- To provide customized rates and billing dates.
- To streamline bill investigations.

- To detect tampering of Meters.
- To provide accurate measurement of transmission losses.
- To implement better network performance and cost efficiency.
- To provide effective demand and distribution management.
- To provide more intelligence to business planning.
- To establish better company credibility.
- To prevent theft detection from unregistered users.
- To avoid tech savy criminals to detect occupancy of consumer's home.
- To become easier of monitoring of electrical consumption of users with the help of cloud computing.

Customer Benefits:-
- To provide precise consumption information.
- To provide clear and accurate billing.
- To provide metering outage information and faster recovery.
- To prevent theft due to occupancy detection of users home.

V. CONCLUSIONS

This paper is mainly concentrated on IOT network. First point is we converting energy meter which is about the project there are electromagnetic into a digital meter. We are doing automatic reading and also connection and disconnection of meters using wireless module. Then meter reading has come faster. It is available for the customers. The peoples will be using the information as per their requirements and they will be having freedom to check the bill, tampering, when the meter has been connected and disconnected before the due date. So concluding that we are successfully monitored the tampering seal tampering and we have read the meter bills which also be uploaded on the website

using IOT concept. Overall the new things we are worked with in our project are controller coupled with Arduino controller and the IOT model.

Metering Meter Reading is a unique solution for problems in existing manual system. metering Meter Reading is self assured automation system. Implementation of metering Meter Reading with the help of standalone system is an innovative idea. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources but with the help of metering Meter Reading, we can easily overcome this. Standalone system is most suitable to implement transfer of unit. The prepaid services, we can make proper use or storage of electricity. benefits include increased cash flow, lower labor and equipment cost, increased accuracy and less costs some customer benefits include improved service quality, more customer choices and faster response time.

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[2]. Jingrui Xie, Tao Hong, and Joshua Stroud "Long-Term Retail Energy Forecasting With Consideration of Residential Customer Attrition" IEEE Transactions on Smart Grid 2015.

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Evaluation of Transmission Pricing Methodologies for Power Trading Markets

Mrs. Archana Shirbhate*, Mr. V.K.Chandrakar, Mr.R.M.Mohril
Department of Electrical Engineering, RTM Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

The paper evaluates transmission pricing methods under liberalized market conditions. Several concepts are being discussed, whereas three main categories can be distinguished: rolled-in transmission pricing, incremental transmission pricing and embedded/incremental transmission pricing. In order to clarify the general framework in which electricity trading and therefore transmission takes place, the basic principles of electricity markets. The electricity markets and liberalization it becomes obvious, that the question is no longer if competition should be introduced but how to organize markets in order to achieve an optimum performance. Power delivery is nowadays a bundle of many services including mainly generation, transmission and distribution. While the former vertically integrated utilities charged one price for power delivery today every single service has to be priced separately

Keywords: OPF, Power Market, Transmission Pricing, IEEE bus

I. INTRODUCTION

That a countries' electricity market has been liberalized is a very common but likewise unspecific proposition. "Delivered power is a bundle of many services. These include transmission, distribution, frequency control and voltage support, as well as generation Each service requires a separate market, and some require several markets. Liberalization does not necessarily mean perfect competition and it does not necessarily include all markets reaching from generation to ancillary services. It is obvious, that in reality a clear distinction between the different markets does not exist. But, in order to clarify structures, this report mainly follows the theoretical approach of distinguishing and analyzing single markets. Perfect Competition is stated that the theory of perfect competition is well developed but not applicable to the "real" world. The concept is claimed to be an idealized fiction, useful mainly for the conceptual development of ideas.

In this paper the theory of perfect competition is used to evaluate the different electricity markets in order to work out how 'close' the real markets are to the optimal (theoretical) structure. The estimation forms the baseline of the further market assessments Perfectly competitive markets are referred to be efficient, where "efficiency means

(1) the output is produced by the cheapest suppliers,

(2) it is consumed by those most willing to pay for it, and

(3) the right amount is produced.

Another formulation of efficiency is, that the social welfare has been maximized. A basic example should be suitable to discuss this assertion in more detail. Elementary microeconomics state that the intersection of the supply and demand curve determine a stable equilibrium in perfectly competitive markets (see figure 1). The demand curve represents the aggregated preferences of the consumers. It defines how much the consumers are willing to consume at a certain price. In contrast, the supply curve shows how much output the suppliers are willing to produce at a given price. From the crossing of both curves the competitive price (or market price) and the competitive quantity can be read.
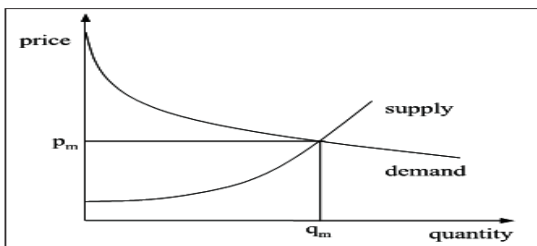
Figure 1. Equilibrium price and quantity in competitive markets

II. METHODS OF CONGESTION MANAGEMENT

The power flow Pij through the transmission line i – j is a function of the line reactance Xij, the voltage magnitude Vi, Vj and the phase angle between the sending and receiving end voltages δi – δj as shown in equation

$$P_{ij} = \frac{V_i V_j}{X_{ij}} \sin(\delta_i - \delta_j) \ldots \ldots \ldots \ldots \ldots (1)$$

From the 2.1, one can see that the power flow can be affected by changing the voltage magnitudes, the reactance of the transmission lines or the power angle (δi –δj). Voltage magnitudes can be controlled through VAR support. The reactance of the line can be reduced through series compensation and the power angle can be varied via power injection changes at either bus, e.g. generation or load changes[3].

In this thesis, voltage magnitudes and power angle are considered for congestion management. The three methods of congestion management provided in the tool are:

1. TLR Sensitivities Based Load Curtailment
2. Economic Load Management for Congestion Relief
3. VAR Support and these are discussed next

2.1 MATLAB

MATLAB is a high-performance language for technical computing. The name MATLAB stands for matrix laboratory. It integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation.

2.1.1 MATPOWER

MATPOWER is a collection of packages of MATLAB M-files to solve power flow and optimal power flow problems. It is intended as a simulation tool for researchers and educators that are easy to use and modify. MATPOWER is designed in such a way to give the best possible performance with simple code to understand and modify [4].

2.2 Concept of Optimal Power Flow

The main objective of an OPF problem is to determine the optimal setting of control variables

in a power system network to optimize an objective function while respecting a set of physical and operating constraints such as generation and load balance, bus voltage limits, power flow equations, and active and reactive power limits. Generally, an OPF Problem can be formulated as ..

III. RESULTS OF TRANSMISSION PRICING PARAMETERS FOR IEEE 14 BUS CASE STUDY

The single line diagram of IEEE-14 bus test system is shown in Figure 2. The system consists of 5 synchronous generators. Associated flow results along with Transmission Pricing are given in Figures and Table as shown below. Table 1 and 2 gives the idea about initial dispatch and re-dispatch value. which is given in Figure10 it also gives their differences.
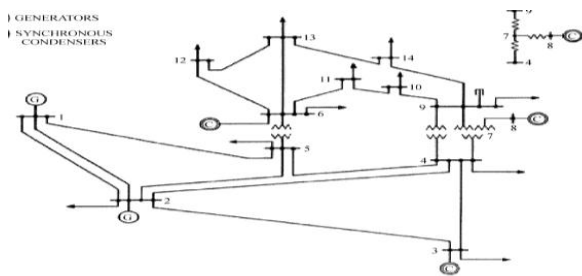
Figure 2. Single Line Diagram of IEEE 14 bus test system

Table 1. Congested lines for Initial Dispatch

Line	Maximum Capacity	Expected line flow capacity	Actual Line flow
1	90	81	84.1196
2	50	45	45.0642

Table 2. Re-Dispatch (MW)

Line	1	2
OPF	112.5	62.5
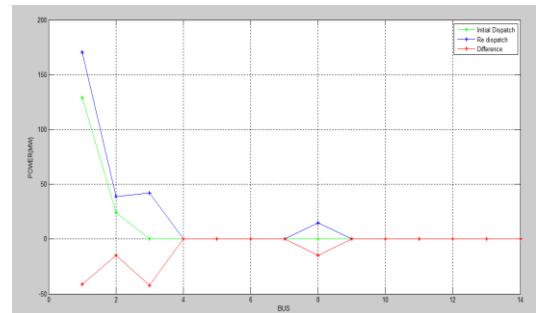
Figure 3. Difference in Initial power flow and Re-Dispatched Power at All Buses in Power System

Result indicates that the difference in load demands at generator bus, whereas difference at other buses are zero. Table 3 provides the contribution of each generator and each load to the line flows under all methods. It illustrate the different results and characteristics between the pricing schemes for each pricing method. The obtained results are shown in Figure 4

Figure 4. Transmission Pricing based on different pricing methods at Generator Buses when load demand is actual

Table 3. Tabulated Transmission Pricing based on different methods when load demand is actual

Methodology	G1	G2	G3	G4	G5
Postage Stamp	40970	9279	10118	10000	3559
MW-Mile (original)	39595	35331	31248	26098	24000
Unused absolute MW-Mile	2383	2918.7	1761.3	999.2	1116.8
Unused reverse MW-Mile	2252.7	2546.8	1574.7	813.8	1011.8
Unused ZCF MW-Mile	2325.7	2754.1	1678.8	917.5	1071
Used absolute MW-Mile	29682	35987	21614	10307	11661
Used reverse MW-Mile	28380	32898	20065	8582	10477
Used ZCF MW-Mile.MW	29031	34443	20840	9444	11069

This figure gives the solution for the minimum power transaction problems. Unused reverse Mw-mile method gives the minimum price. Figure 11, Figure 12 and Figure 13givesTransmission Pricing based on different pricing methods at Generator Buses tested under three conditions like on actual load, 5% increase in load and 10 % increase in load.
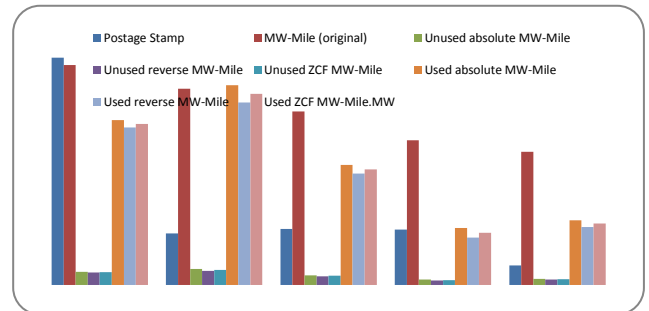
Figure 5. Transmission Pricing based on different pricing methods at Generator Buses when load demand is actual

Table 4. Tabulated Transmission Pricing based on different methods when load demand increased by 5%

Methodology	G1	G2	G3	G4	G5
Postage Stamp	35031	9774	13524	38	5150
MW-Mile (original)	24617	27234	26431	24104	24000
Unused absolute MW-Mile	2159.8	2992.7	2178.6	1226	1156.2
Unused reverse MW-Mile	2018	2778.9	1891.6	1161.2	1165.8
Unused ZCF MW-Mile	2095.4	2895.2	2047.7	1196.8	1161.1
Used absolute MW-Mile	27494	40258	26630	14402	13246
Used reverse MW-Mile	25824	38209	23793	13404	12922
Used ZCF MW-Mile.MW	26659	39233	25212	13903	13084
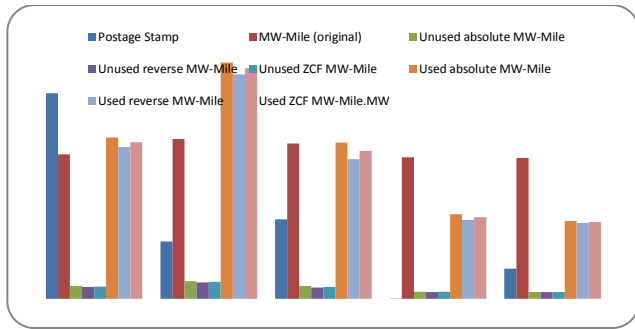
Figure 6 . Transmission Pricing based on different pricing methods at Generator Buses when load demand is increased by 5%

Tabular representation is given in table 3,table 4 and table 5 Analysis is that Unused reverse Mw-mile method gives the minimum price under three different load conditions. The results indicate that the unused MW-mile method will be the preferred for calculating the transmission pricing.

Numerical examples are provided to compare the results using different pricing methodology. At the End of the paper, a case study is carried out to access the effectiveness of the methodology developed.
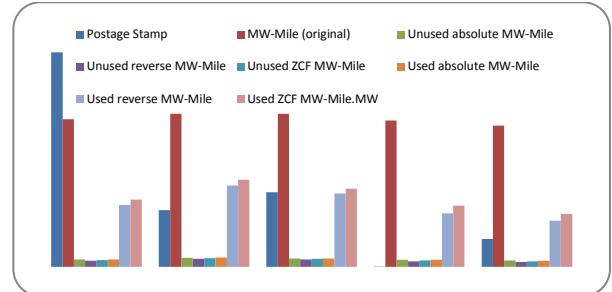
Figure 7. Transmission Pricing based on different pricing methods at Generator Buses when load demand increased by 10 percent

Table 5. Tabulated Transmission Pricing based on different methods when load demand is increased by 10 %

Methodology	G1	G2	G3	G4	G5
Postage Stamp	36521	9650	12676	8	4758
MW-Mile (original)	25130	26014	26047	24904	24000
Unused absolute MW-Mile	1221.7	1528.8	1405	1214.9	1060.3
Unused reverse MW-Mile	1025.3	1363.3	1259.5	914.1	785
Unused ZCF MW-Mile	1137.3	1458.6	1343	1085	941.4
Used absolute MW-Mile	1233.8	1576.9	1407.2	1165.4	1008
Used reverse MW-Mile	10489	13857	12449	9088	7830
Used ZCF MW-Mile.MW	11414	14813	13260	10371	8955

IV. CONCLUSION

This paper presents computation of different transmission pricing for a case study of standard IEEE 14 bus system as an integral part of simulator built for deregulated power trading. Features of simulator include in depth analysis of various pricing schemes, management scheme and effect of Re-dispatch with optimal power flow constraint to relieve congestion. The programmed simulator offers a set of methods to calculate the allocation of these costs by the loads and generators and re-

dispatch criteria. The trading philosophy with contracts based on different pricing can be negotiated in techno-economical way. In this paper we presented a case study based on the IEEE bus network. Several congestion situations and transactions along with pricing both in the pool and bilateral contracts were analyzed and pricing based re-dispatch congestion management were implemented in MATLAB, while optimal power flow was also used for the purpose of the method's evaluation. In this paper eight transmission pricing methodologies have been evaluated. Moreover, it is clear that Unused reverse MW-Mile method gives minimum pricing method even when the load changes. However, this pricing method is able to fulfill transmission pricing objectives: economic efficiency non-discrimination, transparency and cost coverage and can be also applied to large power system with economics as integral part proved to be effective as a temporary solution. MATPOWER calculation gets economical boost with such strategy. All the methods have been tested for all the pricing methods on IEEE 14 bus system. The methods were implemented in MATLAB, while optimal power flow was also used for the purpose of the method's evaluation. In this paper eight transmission pricing methodologies have been evaluated. Moreover, it is clear that Unused reverse MW-Mile method gives minimum pricing method even when the load changes. However, this pricing method is able to fulfill transmission pricing objectives: economic efficiency non-discrimination, transparency and cost coverage and can be also applied to large power system

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Analysis and Improvement of Power System Security by Placing Series FACTS Device

Nahid Khan, Ishraque Ahmad, Mohsina Anjum
Department of Electrical Engineering Anjuman College of Engineering & Technology, Nagpur, Maharashtra,
India

ABSTRACT

Stressed power system, either due to increased loading or due to severe contingencies, it will lead to situation where system no longer remains in the secure operating region. Under these situations, it is primary objective of the operator to apply control action to bring the power system again into the secure region. Any delay or unavailability of suitable control leads to the unstable system. In fact, contingencies results into voltage limit violations and leads to overloading of lines. The system overloading can be recover by two alternatives firstly by restructuring the power system and secondly by controlling the line parameters. The Power system restructuring requires expanding unused potentials of transmission systems but environmental, right-of-way, and cost problems are major hurdles for power transmission network expansion. Nowadays, FACTS devices are used as an alternative to reduce the flows in heavily loaded lines, it will results in an increased loading, low system loss, improved stability of the network, reduced cost of production. In this paper, first contingency conditions are analyzed after that according to severity of contingency a real power flow performance index (PI) sensitivity based approach and the line outage distribution factor has been used to decide optimal location of series FACTS device, Thyristor controlled phase angle regulator(TCPAR) to restabilize the system. The effectiveness of the proposed controller has been tested on modified IEEE 14 bus system using Power world simulator 12.0 software.

Keywords: Optimal location of series FACTS device, Thyristor Controlled Phase Angle Regulator (TCPAR), Contingency analysis, Sensitivity (Severity) index method, Line outage distribution factor (LODF) , Power World Simulator Software version 12.0.

I. INTRODUCTION

Electric utilities are forced to operate the system close to their thermal and stability limits due to major hurdles such as environmental, right-of-way and cost problems for power transmission network expansion. Controlling the power flow in an electric power system without generation

rescheduling or topological changes can improve the performance considerably. Hence, there is an interest in better utilization of available capacities by installing Flexible AC Transmission System (FACTS) devices such as thyristor controlled series compensators, thyristor controlled phase angle regulators and unified power flow controllers etc. These devices, by controlling the power flows in

the network, can help to reduce the flows in heavily loaded lines, resulting in an increased loadability, low system loss, improved stability of the network and reduced cost of production. The increased interest in these devices is essentially due to increased loading of power systems and deregulation of power industry.

In power system without violating specified power dispatch addition of controllable components such as controllable series FACTS devices can changed line flows in such a way that, losses minimized, thermal limits are not violated ,stability margin increased, contractual requirement fulfilled etc. FACTS devices have considerable high cost, so placement of FACTS devices at Optimal location is a very important concept, so as to recover the overloaded system economically and regain the system security as early as possible.

The purpose of this paper is to locate the FACTS devices at Optimal location for eliminating the insecurity of power system. A method to determine the optimal locations of thyristor controlled Phase Angle Regulator (TCPAR) has been suggested [1]. The proposed algorithm has been demonstrated on a modified IEEE 14 bus system.

II. MODELING OF FACTS DEVICE TCPAR

Here an injection model has been used to calculate the sensitivity of real power flow performance index with respect to control parameters [1]

In TCPAR , the phase shift is accomplished by adding or subtracting a variable voltage component in perpendicular to the phase voltage of the line. The static model of a TCPAR in a transmission line between bus-i and bus-j is shown in Fig. 1. From the basic circuit theory, the injected equivalent

circuit of Figure 2 can be obtained. The injected active power at bus-i(Pis) and bus-j (Pjs) of a line having a phase shifter can be written as [1]

$$P_{is} = -V_i^2 K^2 G_{ij} - V_i V_j K[G_{ij} Sin\delta_i - B_{ij} Cos\delta_i] \quad (1)$$

$$P_{js} = -V_i V_j K[G_{ij} Sin\delta_{ij} + B_{ij} Cos\delta_{ij}] \quad (2)$$

Where , $K = \tan\phi$
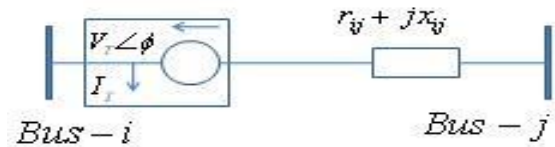
Figure 1. Equivalent circuit of TCPAR
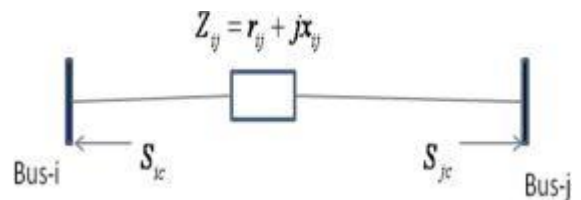
Figure 2

III. METHODOLOGY AND SOLUTION TECHNIQUE

Energy control centre mainly performs three functions for system security are - System monitoring, Contingency analysis and Corrective action plan.

From the above discussion it is observed that there are several methods for finding the optimal location of FACTS devices like Sensitivity Approach, Line Outage Distribution Factor, Genetic Algorithm, Particle Swarm Optimization method. In this paper the whole procedure divided into two parts. First the contingency analysis will be perform by line outage distribution factor after that for removing the effect of contingency conditions from the system optimal location of FACTS devices are done by Sensitivity index method.

From above Table 1 , it is found that placement of series FACTS device in line 1-5 is suitable for removing overloading present in line 1-2 , which is the most negative line outage distribution factor .

$$a_{l,t} = \frac{\Delta f_l}{f_t}$$ (3)

Where,

$a_{l,t}$ = line outage distribution factor when monitoring *l*th line after an outage of *i*th line.

Δf_l = change in MW flow on *l*th line.

f_t = precontingency line flow on *i*th line.

Using LODF's it is possible to efficiently determine how line outage of one line will affects other line in the system.

CRITERIA FOR OPTIMAL LOCATION OF SERIES FACTS DEVICE BY LODF METHOD

The series FACTS device should be placed on the most sensitive line. The device should be placed in a line having most negative line outage distribution factor.

TEST CASE AND RESULTS BY LODF METHODS

The proposed method for optimal location of series FACTS device has been tested on modified IEEE-14 bus system by using Power world simulator software 12.0. In modified IEEE-14 bus system, line 3-4 is a outaged line. The critical line outages were computed by line outage distribution factor for a single line outage case.

Table 1. % LODF on modified IEEE 14-bus system when line 3-4 is outage

Line	From bus i to j	%LODF	Ranking
1	1-5	0.2283	1
2	2-5	0.3582	2
3	2-4	0.484	3

Placement of series FACTS device in lines 2-5 and 2-4 will be less effective than line 1-5 .

$$PI = \sum_{m=1}^{N_l} \frac{w_m}{2n} \left(\frac{P_{lm}}{P_{lm}^{max}} \right)^{2n}$$ (4)

Where

P_{lm} is the real power flow

P_{lm}^{max} is the rated capacity of line-m,

n is the exponent and

w_m is a real nonnegative weighting coefficient which may be

IV. LINE OUTAGE DISTRIBUTION FACTOR

Line outage distribution factors gives the effect of lost of any line in a system which results into overloading of a particular line. It is defined as, the change in flow on a line as a percentage of the pre outage flow on another line.

The real power flow PI sensitivity factors with respect to the parameters of TCPAR can be defined as, Using equation (4), the

sensitivity of PI with respect to FACTS device parameter ϕ_k for TCPAR connected between bus-i and bus-j, can be written as

$$\alpha_k^s = \frac{\partial PI}{\partial \phi_k} = \sum_{m=1}^{N} w_m r_{lm} \left(\frac{1}{r_{lm}^{max}} \right)^4 \frac{\partial P_{lm}}{\partial \phi_k}$$ (5)

= PI sensitivity with respect to TCPAR placed in line-k

Here transformer is inserted, the reactance is 0.1j has been considered. Putting all above values in equation (5) will give us the new sensitivity factor when TCPAR is employed in the

system i.e. α_k^s .

From this factor first sensitivity has been calculated manually and then it is being verified by simulation results.

V. SIMULATION RESULTS

The proposed method has been tested on modified IEEE 14 bus system, which consists of 5 generators and 20 transmission lines. The generator and transmission –line data relevant to the system are taken from IEEE standard 14 bus system. The slack bus bar voltage was fixed to its specified value of 1.06 p.u.. Figure 5 shows the modified IEEE 14 bus system and Figure 6 shows contingency effect when line 3-4 is outaged it will overload line 1-2 from 103% to 107%.
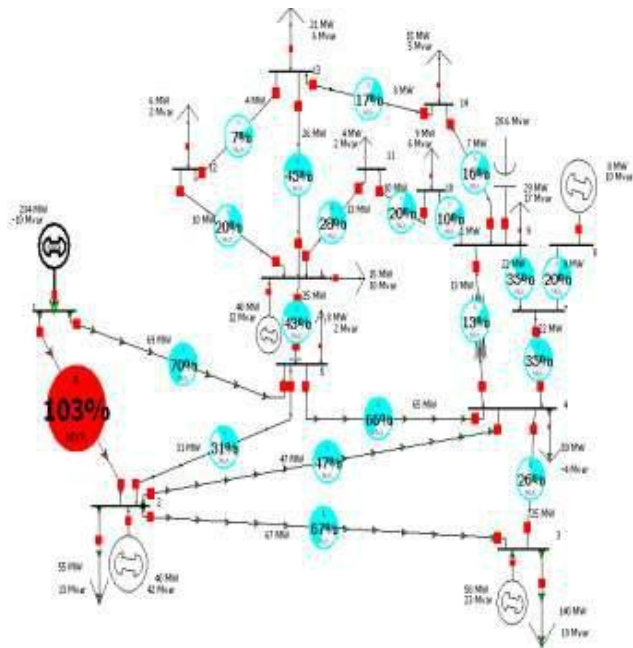
Figure 3. Modified IEEE 14 bus system
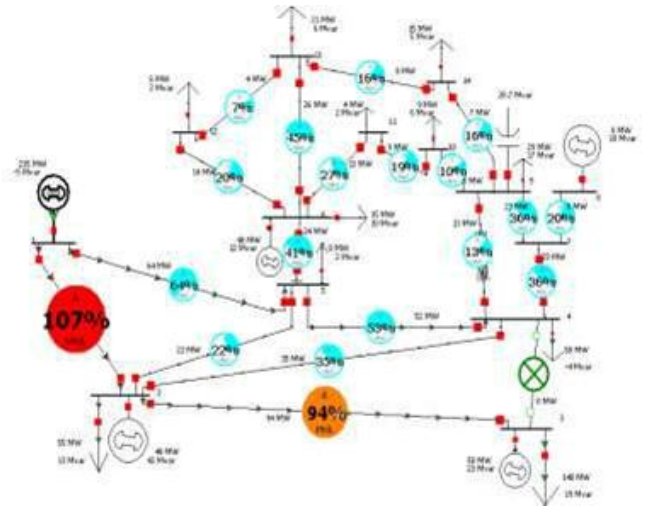
Figure 4. Modified IEEE 14 bus in which line 1-2 is overloaded when 3-4 line is outaged

Criteria For Optimal Location Of Tcpar (By Real Power Flow Performance Index Method)

The FACTS device should be placed on the most sensitive lines. The Criteria for Optimal Location of TCPAR device is based on sensitivity index computed by equation (5). The TCPAR should be placed in a line k having highest value of the sensitivity index.

TEST CASE AND RESULTS FOR TCPAR (By Real Power Flow Performance Index method)

The Placement of TCPAR is obtained on the basis of real Power flow Performance index method. It is assumed that the limits of the phase shifting angles of TCPARs were taken

as $\pm$ 30°. The results of the sensitivity factor of modified IEEE 14 bus system are as shown in Table (2).

Table 2. Sensitivity Factor of Modified IEEE 14 bus system for TCPAR (when line 3-4 outaged)

Line K	From bus i to bus j	Phase Shift (ϕ)	Sensitivity factor s (α_k)	Ranking
1	1-5	-10	-326.87	1
2	2-5	11.5	-329.78	2
3	2-4	10	-330.03	3

Sensitivity Factor for heavily loaded lines are presented in
Table (2). Table (2) shows that the placement of TCPAR in

line 1-5 is most sensitive as compare to other lines. The Placement of TCPAR in line 1-5 will reduce the loading of line 1-2. The best location of TCPAR is line 1-5.

Figure 5. shows the TCPAR placed in line 1-5 removes the overloading. Here one new bus i.e. bus no. 15 has been added in the system and for phase shifting a transformer is connected between new added bus and bus no.5. It will change the phase shift between line 1-5. The Figure 5. shows that, the power flow is within range and hence we will get back the system to its stable state . TCPAR placement in line 1-5 will reduce the overloading from 107% to 91%, which shows that the system came back to its stable condition. Here, -10⁰ phase shift compensation has been used.

Similarly, Figure 6. shows that the TCPAR is placed in line 2-5. It will reduce the congestion present in line 1-2 from 107% to 92% . Here, 11.5⁰ phase shift compensation has been used. Figure 7. shows that the TCPAR is placed in line 2-4. It will reduce the congestion present in line 1-2 from 107% to 96%. Here, 10⁰ phase shift compensation has been used.
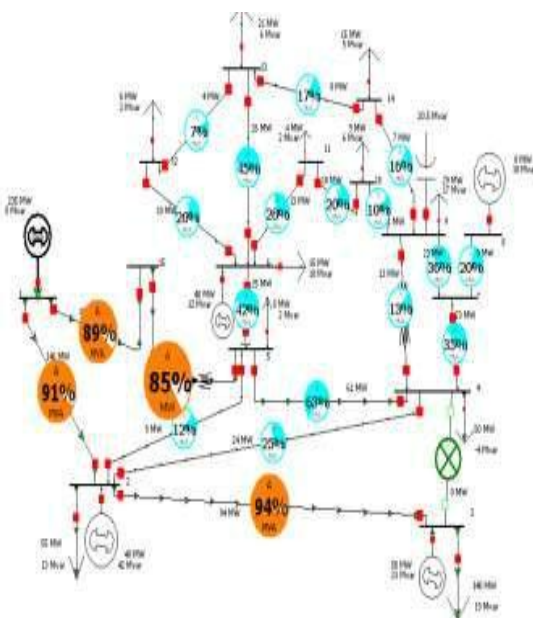
Figure 5. Modified IEEE 14 bus system with TCPAR is placed in line 1-5
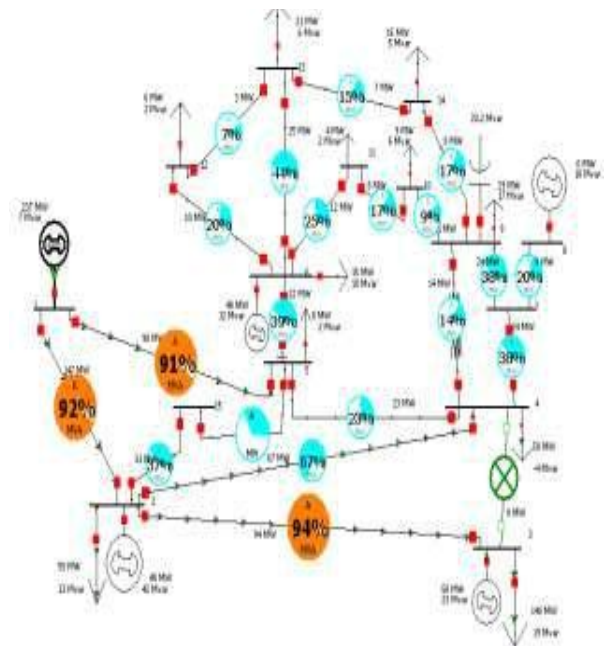
Figure 6. Modified IEEE 14 bus system with TSPAR placed in line 2-5
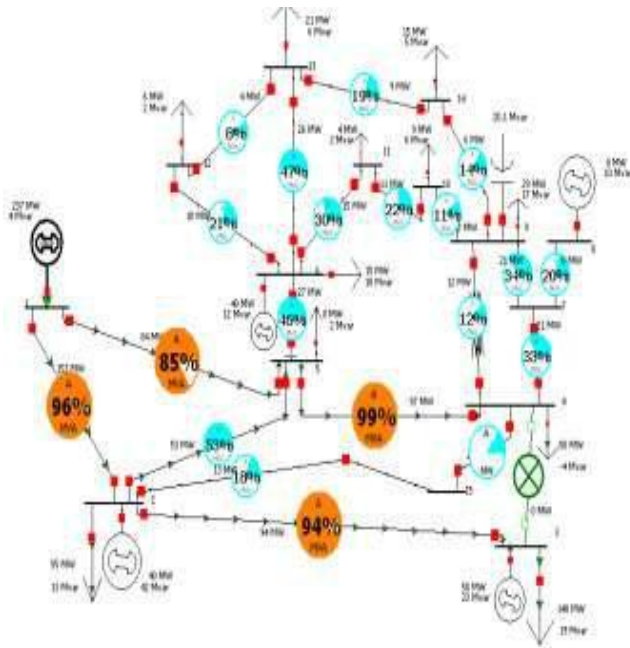
Figure 7. Modified IEEE 14 bus system with TCPAR is placed in line 2-4

VI. ADVANTAGES OF TCPAR

- ✓ Voltage and phase angle regulation.
- ✓ Power flow control.
- ✓ Real and Reactive loop power flow control.
- ✓ Improvement of Transient stability.
- ✓ Power oscillation damping.
- ✓ It shows high ability to reduce losses, control steady state power flow and increase system capability and improve reliability.

VII. CONCLUSION

In this paper , a sensitivity based approach has been used for determining the optimal placement of TCPAR. In a congested system, the optimal location of TCPAR can be effectively decided based on the real power flow Performance index. Sensitivity factors which indicates the reduction of the total system real power loss and will also improve the system voltage profile. In this paper first line outage distribution factor has been calculated after that sensitivity index is being calculated and on

comparing both the results we get the same ranking for TCPAR and from that it is concluded that the best suitable Optimal location of TCPAR is on line 1-5.

The effectiveness of the sensitivity method has been tested on Modified IEEE 14 bus system by using Power world Simulator Software Version 12.0. From both the methods and from Power world simulator results, it is concluded that 1-5 line is the best Optimal location for the FACTS device TCPAR.

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Computerized Underwater Robot to Clean Water Tank

Ramni Kore , Sneha Thawari, Tejaswi Meshram, Nikita Padhye, Amey Puranik
K.D.K. College of Engineering , Nagpur, Maharashtra, India

ABSTRACT

In today's world, cleaning of storage water tanks is a tedious job. Entire work needs to be done manually, and when manual work is considered, it is a risky task. Considering height of water tanks the shortage of oxygen can be a major issue. Hence the need for use of underwater robotic systems has become more apparent. We are developing a system in which user will remotely navigate the robot the way he wants as well as control certain operations like cleaning, brushing, sucking etc. This paper surveys a state of art for underwater robotic technologies. This project aims to provide key reference for future development in automated underwater cleaning.

Keywords: Relay interface unit, RF trans-receiver,

I. INTRODUCTION

Many of today's robots are inspired by the science of bio-inspired robotics. The concept of creating machines having the ability to automate operations. It has been already assumed that it won't be long when robots will start to mimic humans.

There has been a tremendous growth of water tanks especially in a populated country like India. The need of managing these water tanks has become evident. Water is one of the most important ingredient for human beings. There is a need to ensure that the water is neat and clean because there can be possibility of impurities within the water tanks which is mostly because of formation of algae. The algae are a diverse group of organisms. They survive using photosynthesis by using carbon dioxide and water along with sunlight for energy and growth. Algae can form spore, these are highly tough cells which can survive rough treatment, even the local water purification system. Other possibilities of impure water are dust or suspended solids inside water, germs, bacteria, or parasite growth. Manual cleaning is a hectic task and may even result into accidents. Slippery floor and insufficient oxygen might cause accidents. Automated cleaning will avoid all the pitfalls encountered with manual cleaning.

II. LITERATURE SURVEY

Existing System:
There is no such automated system currently available for managing and cleaning storage tank water. Entire work needs to be done manually and when manual work is considered, it is risky task. Considering the height of water tanks the shortage of oxygen can be major issue. Because of this one cannot guarantee complete error free work.

Working in an impure tank can be hazardous to health due to presence of bacteria, parasites etc.

III. PROPOSED SYSTEM

We are developing a system in which user will remotely navigate the robot the way he wants as well as control certain operations like cleaning, brushing, sucking etc. With a key press from keyboard will send a control signal (radio frequency pulse) to robot in wireless manner which will initiate a relay and through relay it will turn on its motor in corresponding direction. As user is viewing the robot through camera, it is relatively easier and possible to move it in any direction.

This will overcome the drawbacks of previous system by eliminating manual labor. The user will be able to control the motions of the robotic vehicle wirelessly and navigate it flawlessly by observing it through implemented camera. Robot can even flush the impure water so that it can be easily drained out. This will ensure that the tank is ready for accumulation of clean water.

IV. PROBLEM DEFINITION

The storage water tanks are built at great heights. As water is one of the most important ingredient for human beings, it is necessary to keep the stored water as well as the tank clean. An underwater robotic system will help to clean the water tank efficiently without any human intervention. These robots can be operated remotely to employ complete automation. This will eliminate human errors because there is no need for one to be physically present inside the water tank. Task will be time efficient and achieve better results than manual cleaning.

V. METHODOLOGY

The prototype of computerized underwater robot to clean water tanks using radio frequency wireless trans-receivers will be implemented as follows :

- Complete layout of whole system will be prepared in the form of block diagram.
- With a key press from keyboard the key press event will be generated and will get verified by the code and corresponding hexadecimal signal will be generated.
- This hexadecimal signal is converted into binary signal and given to the LPT port.
- Using the 6 data pins of the LPT port (D0 – D5) this binary signal is given to the transistor card (interfacing card).
- Using RF transmitter this signal is passed on to the relay card wirelessly using frequency modulation technique that is FSK modulation or Amplitude modulation in encoded form.
- At the relay card, this signal will be decoded and based on the input given by the user particular action gets performed such as brushing, flushing or navigating the robot.

A. LPT port (25 pin L type)

It is one of the most used printer interfaces, as every windows/dos/linux pc has a female connector LPT1. Parallel port supports 9 bit or 12 bit input at a time. LPT ports can be used for home-made projects due to their small internal circuitry it makes the interfacing task much simple. The LPT port is comprised of 4 control lines, 5 status lines and 8 data lines. LPT port in most of the cases is found at the back of the PC near 25 Pin D-SUB female connector. TTL logic levels is used as data output to parallel port. Parallel ports are generally

implemented in ASIC and provide 12ma of source and sink.

B. BC547 transistor (NPN)

It is an negative positive negative(NPN) junction transistor. A transistor is used to amplify current. The word transistor means transfer of current. A small current at its base terminal controls larger current at collector and emitter terminals. BC547 is most of the times used for applications and switching purposes having maximum current gain of 800.The transistor terminals require a fixed DC voltage to operate the desired region of its characteristic properties. This is called as biasing. For "I" applications, the transistor is biased such as it is partly ON for all input conditions. The input signal at base is amplified and provided to the emitter. BC547 is used in common emitter related configurations for amplifiers. For switching applications, transistor is biased so that it remains fully ON only if there is signal on its base otherwise it remains completely OFF.

C. FSK Modulation by RF Trans-receivers

FSK modulation represents a frequency modulation scheme in which digital information is transmitted through distinct frequency changes of the carrier wave. Most of the early telephone line modems used audio frequency shift keying to send and receive data at rates above 1200bps (bits per second). FSK is commonly used in caller identification and remote metering applications. FSK modulation can be achieved by using radio frequency trans-receivers. RF trans-receivers will provide a complete wireless interface up to a range of 300 meters. This will ensure the working of robot within as far as 300 meters.

D. Encoder (22 and 40 MHz)

An encoder is a device or a circuit which converts information from one format or code to another, for the purposes of standardization, speed, security or compressions. Here we will make use of 2 encoders. One will be 22 MHz to drive 4 motors connected to wheels of robot. The other one will be of 40 MHz to control certain operations such as flushing and brushing. An encoder assigns a binary code to an active input line. As the motion of wheels requires less power 22MHz encoder will be enough. The remaining flushing and brushing mechanism will require a larger rpm dc motor thus a greater encoder.

E. Camera

A camera will be mounted on the robot itself, to detect and observe the impurities inside the tank. The output of the camera will be interfaced with a computer to view the contents displayed by the camera on a computer. So, it will allow user to remotely navigate the robot anywhere within the water tank. Being water proof, this camera will be able function inside water also.

VI. BLOCK DIAGRAM
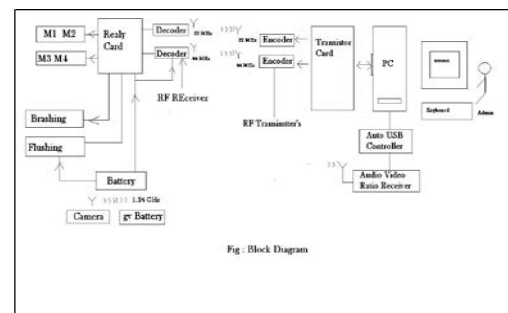
Figure 1. Block Diagram of System

VII. OVERVIEW OF ALGORITHM

A. Algorithm For Navigating Robot :-

1. Start.
2. Detect the parameter from various sensor

modules of the vehicle like the Push Sensors.

3. Feed these parameters to the Transistor Driver Card to convert analog to digital format.

4. Then forward these parallel

5. Then the Processor process these parameters.

6. At the same time the accelerometer input is given to the Microcontroller which is used as an interface to the Processor's.

7. If dust is founded then the processed parameters exceed their limit and the current co-ordinates of the vehicle are noted.

8. Then the RF trans-receiver is used to send an message to the corresponding authorities which contains the co- ordinates of the vehicle.

9. If the parameter does not exceeds the limit, goto Step 2

10. Exit

B. Algorithm For Brushing Operation :-

1. Start

2. Observe if any impurities are visible through the camera and navigate the robot to respective location.

3. If dust is found operate the brushing wheel through the key press event from system.

4. Stop

C. Algorithm For Flushing Operation :-

1. Start

2. Detect if any impurities in water are present

3. With a key press event from user, turn on the suction motor to suck impure water so that it could be drained out efficiently

4. Stop

VIII. FUTURE SCOPE

The robot can be submerged inside water completely by making entire robot waterproof with use of chromium coating on it. Fins and propellers can be attached to robot so that it can move underwater in any direction just like fishes. pH sensors can be implemented on robot to determine quantity of impurities present in water. Chlorine tube can be added to the robot to perform chlorination of water.

IX. CONCLUSION

Hence we are implementing a new idea for wireless robot control system which will clean water tank efficiently without any human intervention in addition to that it will also save manual work, avoid accidents. This automated task is efficient to brush up impure water or bacteria at the core of water tank and suck the impure water for proper reuse or disposal.

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Power Grid Synchronization Failure Detection for Unacceptable Range of Voltage and Frequency

Shweta Bandre, Shubhangi Motghare, Swati Singanjude, Surya Wagh, Swati Dhote, Vaishanvi Ghugal, Prajakta Ashtankar

Department of Electrical Engineering, Smt. Rajshree Mulak C.O.E For Women, RTMNU, Nagpur, Maharashtra, India

ABSTRACT

The project is designed to develop a system to detect the synchronization failure of any external supply source to the power grid on sensing the abnormalities in frequency and voltage. There are several power generation units connected to the grid such as hydel, thermal, solar etc. to supply power to the load. These generating units need to supply power according to the rules of the grid. As per CENTRAL ELECTRICTY AUTHORITY OF INDIA REGULATIONS 2010, variation of the system voltage should be of ± 5 % and make all efforts to operate at a frequency close to 50 Hz and shall not allow it to go beyond the range 49.2 to 50.3 Hz. These rules involve maintaining a voltage variation within limits and also the frequency. If any deviation from the acceptable limit of the grid it is mandatory that the same feeder should automatically get disconnected from the grid which by effect is termed as islanding. This prevents in large scale brown out or black out of the grid power. So it is preferable to have a system which can warn the grid in advance so that alternate arrangements are kept on standby to avoid complete grid failure. Further the project can be enhanced by using power electronic devices to isolate the grid from the erring supply source by sensing cycle by cycle deviation for more sophisticated means of detection.

Keywords: Synchronization, Islanding, Grid, Voltage variation, Frequency variation, Black out.

I. INTRODUCTION

In India we have five national grids, Western grid, Eastern grid, North-East grid, Southern grid, Northern grid. Northern grid, Eastern grid, North-East grid, Western grid are synchronized with each other and southern grid is asynchronized. The modern society is so much dependent upon the use of electrical energy that it has become a part and parcel of our life. Several new trends have already employed in the electricity infrastructure. It includes the expansion of the existing grid with micro grids and mega grids, extensive sensors, data processing, visualization tools, etc. For synchronization of all power generating station with State as well as National power grid we have selected three parameters voltage, frequency and phase angle between voltage and current if any of these parameters is violated due to any abnormality or fault the power station will not be able to fulfill all the three condition for synchronizations so it will get a synchronized with grid and its called

situation of ISLANDING. Islanding state occurs when one or many sources continue to feed power to a part of the grid that is disconnected from the main utility. Islanding situations can damage the grid itself or equipments connected to the grid and can even compromise the security of the maintenance personnel that service the grid.

1.1 CONCEPT OF GRID

An Electric grid is a network which can consume synchronize power from distributed generation unit and deliver or provide to the load that are connected by transmission and distribution line. Also it is network of cables or pipes for distributing high voltage power. Grid is a center of power transmission from that power is transmitted over all the area. In a synchronous grid all the generators are connected in parallel and run not only at same frequency but also at the same phase. Grid failure or power blackout is the total loss of power to an area. Blackout which result from or result in power station tripping are particularly difficult to recover quickly. Power outage or blackout may last from a few minute to a few week depending on the nature of blackout and configuration of electric network.

1.2 CONCEPT OF SYNCHRONIZATION

Synchronization is the process of the closing the circuit breaker after matching the generator frequency, phase angle and voltage magnitude with grid frequency, phase angle and voltage magnitude respectively. The synchronization is not done in ac generator unless it is running at same frequency as that frequency of grid and the dc generator have to adjust its open circuit terminal voltage to synchronize with grid voltage.

1.3 ISLANDING

Islanding is an unsafe condition which occur on grid, in which extra feeding of power is done to grid from distributed generator unit, even though the utility of power from grid is down. Also when the islanding occur on grid feeder is get open to secure the grid from the blackout or grid failure.

II. DETECTION OF POWER GRID FAILURE

The basic principle of this project is to detect the grid synchronization and sensing the voltage and frequency beyond range. The system is based on a microcontroller family. The microcontroller monitors the under/over voltage derived from a set of comparators and under/over frequency from by the interrupt program for the utility grid and the processed value of voltage and frequency for turning ON/OFF the relay between a grid connected inverter and the utility grid.

2.1 Block Diagram
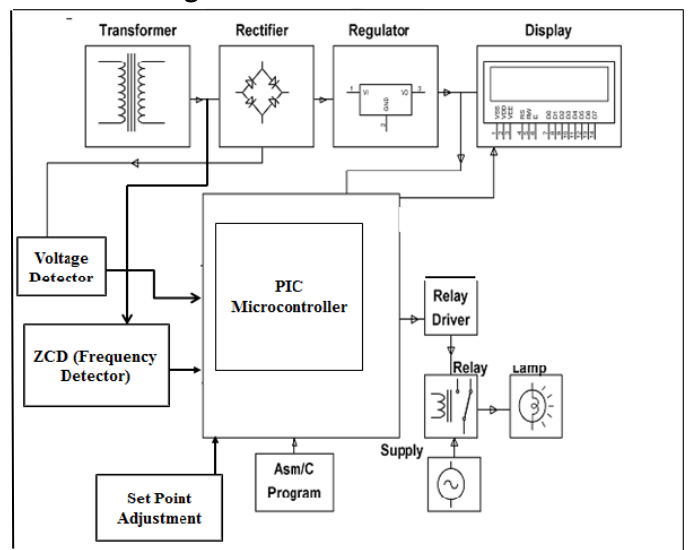
Figure 1. Block Diagram

2.2 COMPONENTS
HARDWARE REQUIREMENTS :

i) PIC Microcontroller   vii) Voltage Regulator
ii) LCD   viii) Relay
iii) Resistors   ix) Relay Driver IC
iv) Capacitors   x) Standard Variac

v) Diodes   xi) Lamp

vi)Transformer   xii) ZCD

SOFTWARE REQUIREMENTS:

i) MPLAB IDE compiler.

ii) Language: Embedded C or Assembly.

2.3 WORKING

The main purpose of this project is to detect the grid synchronization by sensing the voltage and frequency which are not in an acceptable range, and then stopping the power supply towards the distribution system i.e. the supply towards the feeders. In this project we used the grid synchronizing technique is zero crossing detection. In this system, the main supply is given to the transformer which is step down to 230V/12V then that 12V AC supply is given to the zero crossing detector through rectifier and the full wave rectifier is used for the rectification purpose. After rectification is done that dc is given to the capacitor which is used as filter. Then given to voltage regulator IC LM 7805 that convert supply into 5V, 1Amp. After this total process the 5V DC supply is given to the PIC microcontroller. The ZCD (zero crossing detector) used as a comparator for monitoring the under/over voltages and also monitor the natural frequency. A standard variac is used to vary the input voltage and a set point is there which is used to trip the relay for below or beyond the value of set voltage or frequency. The relay is controlled by the relay driver IC, which is connected to the microcontroller. The lamp is connected to the relay contacts for indicating the predictable blackout and brownout. The sensed parameters are send to microcontroller for calculations and processing.

For changing parameters we have to switch the sliding switch to manual position. By varying the POT (variable resistance) we can achieve the different voltage and frequency levels. LCD displays the corresponding frequency level and voltage level and lamp glows on abnormal conditions (undesirable conditions).

III. RESULT AND OBSERVATION

Table 1. Observation Table

Parameter Limits	Voltage (volt)	Frequency (Hz)
Over Range	241.5	50.3
Set Range	230	50
Under Range	218.5	49.2

From the above observation table it is observed that the tolerance of voltage is ± 5 volt and frequency should not go beyond the range 49.2 to 50.3 Hz as per standard. Normally the range of the voltage and frequency is 230 volt and 50 Hz respectively according to Indian standard. In this paper according to the results we observed the following conditions.

WORKING CONDITION

In normal situation, the LED or lamp do not glow indicating 50Hz and stable voltage. In any deviation from voltage range or frequency range, the LED or lamp glow indicating failure of grid synchronization. This program is also written that in either of these cases whether the frequency is low / high (or) the voltage could be either in high / low condition , through the microcontroller they are all displayed in the LCD display and the output is connected to a relay to switch ON or OFF a load.

IV. CONCLUSION

This paper give brief idea about developing a system to detect the synchronization failure of any external supply source to the power grid on sensing the bad voltage and frequency. Number of distributed generator connected in parallel to the grid, to supply power to the load. Each generator having follow the rules of grid. These rules involve maintaining a voltage and frequency variation within limits. When any fault occur on grid and due to this grid broken a rules and deviation occur in voltage and frequency. When deviation occur in grid feeder is mandatory to open from grid and this process is term as islanding. This prevent grid failure or blackout.

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[4]. Laukikraut123@gmail.com,

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Automatic Engine Locking System Alcohol Detection for Drunk & Drive with GSM

Taufique Qureshi, Tejaswini Patil, Aliya Tabassum, Shafique Sheikh, Mohsina Alam
Department of Electronics and Telecommunication, Anjuman College of Engineering and Technology, Nagpur,
Maharashtra, India

ABSTRACT

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others. In this project, we are developing an Auto Lock System with GSM. The input for the system is from Detection Sensors either from Alcohol Breath or any other mechanism. The controller keeps looking for the output from these sensors. If there are any traces of Alcohol above the set limit, then the system will lock the Engine and send the message to the concerned person of the driver, so that person will take of both the vehicle and driver. As vehicle automobiles are beyond the scope of this project, we are simulating the process by activating the relay and with the help of dc motors.

Keywords: Automatic Engine, Global System for mobile (GSM), Microcontroller, Alcohol Sensor (MQ3)

I. INTRODUCTION

Most of these days, we hear lot of accidents due to drunken driving. Drunken drivers will not be in stable condition and so the rash driving is the inconvenience for other road users and also question of life and death for the drunken driver and for others. The system uses a compact circuitry built with microcontroller with a non-volatile memory capable of retaining the password data for over ten years. Programs are developed in embedded C. The main purpose behind this project is "Drunken driving detection". Now-a-days, many accidents are happening because of the alcohol consumption of the driver or the person who is driving the vehicle. Thus drunk driving is a major reason of accidents in almost all countries all over the world. Alcohol Detector in Car project is designed for the safety of the people seating inside the car. This project should be fitted / installed inside the vehicle. By implementing this design a safe car journey is possible and also drunken drivers can be controlled. Government must enforce laws to install such circuit in every car and must regulate all car companies to preinstall such mechanisms while manufacturing the car itself. If this is achieved the deaths due to drunken drivers can be brought to minimum level. In this type of system, future scope can be safely landing of car aside without disturbing other vehicles. India had earned the dubious distinction of having more number of fatalities due to road accidents in the world. Road safety is

emerging as a major social concern around the world especially in India. Drinking and driving is already a serious public health problem, which is likely to emerge as one of the most significant problems in the near future. The system implemented by us aims at reducing the road accidents in the near future due to drunken driving. The system detects the presence of alcohol in the vehicle and immediately locks the engine of the vehicle. At the same time an SMS along with the location of the vehicle is send to three pre-selected contacts. Hence the system reduces the quantum of road accidents and fatalities due to drunk driving in future. An effective solution is provided to develop the intelligent system for vehicles which will monitor various parameters of vehicle in-between constant time period and will send this data to the base unit as explained in this paper, by using hardware platform who's Core is microcontroller, Alcohol sensor (MQ3), Global System for Mobile (GSM) module. The designed system would finish the function of communicating with the base station via GSM and control of various parameters. The whole Control system has the advantage of small volume and high reliability. Future scope of this system is to control the accidents and providing useful details about the accidental vehicle, thereby reducing the rate of accidents taking place due to drunken driving. This system brings innovation to the existing technology in the vehicles and also improves the safety features, hence proving to be an effective development in the automobile industry.

II. RELATED WORK

In [1] , they had use PIC 16876A controller, Alcohol sensor, LCD Display And Alarm system to notify driver only, ignition system was immediately off when detected alcohol. In [2], GSM and GPS were used to send location and alcohol detected related message to relative of driver. Location was normally in longitude and latitude which was difficult to locate. Ignition system directly turn off when detected alcohol. In [3], IR LED 894 was used. It was produces high intensity IR ray's, which means it absorb alcohol of only high content from air, so this symbolizes that this mechanism will work only when driver is over drunk for lower concentration of alcohol it was detected accurately. In [4], IR sensor was used to detect obstacle which comes in front of this sensor (vehicle), and when obstacle detected vehicle was stop. It was also monitoring the toxic gases such as CO2, LPG, Alcohol from inside area of the vehicle .If there is high content of gases then SMS had been send to authorized person to notify only. In [5], it describes real-time online prototype driver-fatigue monitor. It uses remotely located charge-coupled-device cameras which was equipped with active infrared illuminators to acquire video images of the driver. Various visual cues that typically characterize the level of alertness of a person are extracted in real time and systematically combined to infer the fatigue level of the driver. The visual cues employed characterize eyelid movement, gaze movement, head movement, and facial expression. If the eye of driver is being continuously closing it mean eye-blink frequency is beyond the normal state and it is in sleeping condition then ignition system would be off immediately.

III. SYSTEM ARCHITECTURE

Here AT89S51 is used as Microcontroller Unit (MCU) which acts as the heart for the system. The system is divided into two parts; one part is for detecting, and another for controlling the parts installed in the car. The working of the system is when the driver sits, in position sensor gets activated and send alert abnormal condition to detect alcohol for the driver. Then the detection process starts and displays the amount of alcohol taken on Liquid Crystal Display (LCD). If the amount of alcohol detected is normal, the vehicle can start. If detects more than the alcohol allowed makes the vehicle cannot work if driver ignores the command and tries to start the car immediately breaks will activate and makes the wheels not to rotate. The ignition will begin only when the key touches +ve and −ve terminals with low o/p at the key terminal, the key fails to complete the circuit where it results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car.
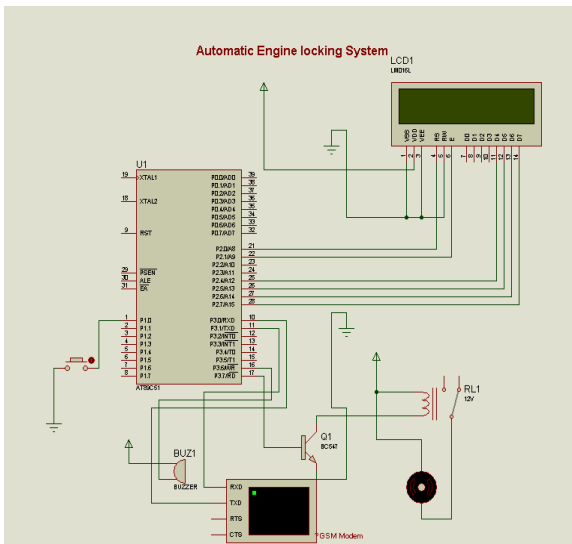
Figure 1. Circuit Diagram of the system

1. Microcontroller (AT89C51):

Now let us talk about this popular 8051 chip. It has on chip ROM in the form of flash memory. This is ideal for fast development since flash memory can be erased in seconds compared to the twenty minutes or more needed for the 8751. For this reason the AT89C51 is used in place of the 8751 to eliminate the waiting time needed to erase the chip and thereby speed up the development time. To use the AT89C51 to develop a microcontroller based system requires a ROM burner that supports flash memory; however, a ROM eraser is not needed. Notice that in flash memory you must erase the entire contents of ROM in order to program it again. This erasing of flash is done by the PROM burner itself.

2. Alcohol Sensor:

The alcohol sensor will detect the alcohol content from human (driver) breath and send its value to microcontroller. Alcohol sensor (MQ3) is suitable for detecting alcohol concentration just like your common breathalyzer. It has a high sensitivity to small value of BAC and fast response time, provides an analog resistive output based on alcohol. it has sno2 as gas sensitive material to sense alcohol.
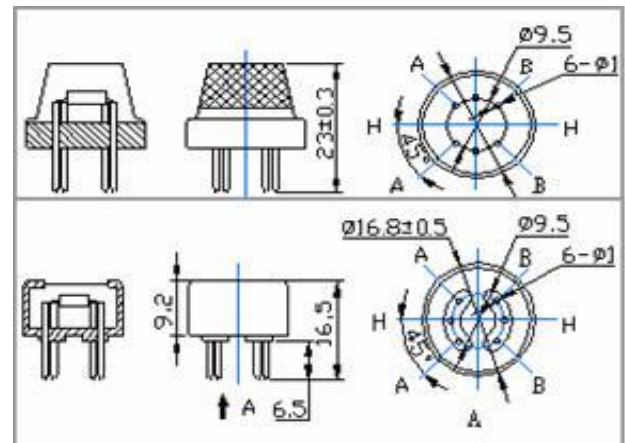
Figure 2. Overview of MQ-3 Alcohol Sensor

3. LCD Display:

The LCD display is fitted inside the car and this LCD display is act as indicator to driver and other people who are sitting inside the car. This display gives indication of alcohol level detected by alcohol sensor, this also provide warning message to driver to stop car or vehicle within particular time afterward car will automatically stop, indication of smoke/gas detected in car.

4. DC Motors:

When alcohol is detected while driving then instead of stop ignition system directly while driving state, signal is passed to fuel blocker and fuel supply is cut-off. This results in fuel supply cut-off to the engine. Thus the engine stops working or doesn't start depending on the position of the car. To demonstrate the project, we used dc motors instead of engine.

5. Relay:

Relay is used to turn off the dc motor by passing low power signal to dc motor .that's mean when alcohol detected power signal is triggered. The advantage of the system is that the driver cannot even tamper with it. Because, the fuel supply valve is open only when all the components are working properly. So if anyone tampers with it or if the alcohol content is above a particular limit, fuel is not supplied and the vehicle cannot be started.

- ✓ Also when the fuel supply is cut-off, the car doesn't stop abruptly. This helps to prevent collision with the vehicles coming behind.
- ✓ This circuit detects the alcohol directly.
- ✓ This circuit is simple in construction.
- ✓ Readily available ICs are used.
- ✓ Responsibility of the circuit is high.
- ✓ High Accuracy

6. Global System for Mobile (GSM)

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services. GSM (Global System for Mobile communication) is a digital mobile telephone system that is widely used in Europe and other parts of the world. GSM uses a variation of Time Division Multiple Access (TDMA) and is the most widely used of the three digital wireless telephone technologies (TDMA, GSM, and CDMA). GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz or 1,800 MHz frequency band. It supports voice calls and data transfer speeds of up to 9.6 kbit/s, together with the transmission of SMS (Short Message Service). Once the alcohol is detected, SMS will be send to the concerned person of the vehicle or driver.

IV. RESULT AND DISCUSSION

The following procedure explains the procedure of flow

- ✓ When driver starting car/vehicle then alcohol sensor start sensing at condition vehicle speed equal to zero.
- ✓ If alcoholic driver detected then immediately ignition system will turn off along with message about detection is send to relevant of driver for notification and notification will be displayed on LCD.
- ✓ A flag is set when first condition is passed without detection of alcohol.
- ✓ When speed of vehicle is greater than zero. i.e. vehicle started to driving then again along with alcohol, start to sense collected parameter values are send to microcontroller.
- ✓ If alcohol detected in this case then signal is send to fuel blocker by microcontroller for

blocking fuel supply to ignition system. So driver feel's that vehicle is going to stop and then place car at appropriate location.

Strategies to be used for proposed system:
1. Starting vehicle by driver.
2. Check alcohol sensor of vehicle.
3. If it is zero then start sensing by various sensors & notifies detection .In this case alcohol is mainly checked if it detected then stop dc motor.
4. If speed is greater than 2 kmph then again sensing started. Detection of various parameters will be sense by sensor & will be notified.
5. At a same time if alcohol is detected then fuel supply will blocked.
6. Vehicle will stop & notify detection and displays in LCD.

V. CONCLUSION

Our system efficiently checks the accidents occurs or not and drunken driving. By implementing this system in vehicle, a safe journey is possible which would decrease the injuries during accidents and also reduce the accident rate due to drunken driving. This system has also accident prevention technology which would reduce the accident of the vehicle in crowd areas. Proposed system will resourcefully detect alcohol through driver breath and stop the vehicle by interrupting the ignition, instead of directly stopping the vehicle. We can implement a mechanism to cut-off fuel supply instead of stop ignition system directly because direct stop of ignition system on detecting an alcohol may be dangerous as driver driving a vehicle at a high speed and it may lead to chance of accident, so after cut-off fuel supply driver will place at a proper position.

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A Review on Home Automation using ESP8266 Development board

Dr. Syed Mohammad Ali[1], Arshad Khan[2], Varun Naidu[2], Aditi Shukla[2] , Meenal Bhutani[2]
[1]Professor, Electronics & Telecommunication, RTMNU/Anjuman College of Engineering & Tech, Nagpur,
Maharashtra, India
[2]Scholars, Electronics & Telecommunication, RTMNU/Anjuman College of Engineering & Tech, Nagpur,
Maharashtra, India

ABSTRACT

With advancement of Automation technology, life is getting simpler and easier in all aspects. In today's world Automatic systems are being preferred over manual system. With the rapid increase in the number of users of internet over the past decade has made Internet a part and parcel of life, and IoT is the latest and emerging internet technology. Internet of things is a growing network of everyday object-from industrial machine to consumer goods that can share information and complete tasks while you are busy with other activities. Wireless Home Automation system(WHAS) using IoT is a system that uses computers or mobile devices to control basic home functions and features automatically through internet from anywhere around the world, an automated home is sometimes called a smart home. It is meant to save the electric power and human energy. The home automation system differs from other system by allowing the user to operate the system from anywhere around the world through internet connection.[2]

Keywords: esp8266 dev board, relay module, Router.

I. INTRODUCTION

Now a days because of modern technology Home Automation System has become very useful for handicapped people. It is very useful to the user to control and handle all the appliances that are connected to the system, from a controlling device. "Easy use of appliances" is main motive of this system. In this system home appliances can be controlled, and the user can interact with the system through a user friendly interface. The home appliances like fans, lights, switches are remotely controlled through a main control board. By using of the Internet of Things (loT), the developing of home automation has become simpler and more popular. Internet of Things (IoT) is nothing but connecting different real world objects to provide proper communication, synchronization, and inter-connection between various devices or physical appliances also known as "Things".

In this system home appliances can be controlled locally and globally through a website from anywhere in the world using Internet. This system is scalable that can add any appliances and it is also secured by password.[1]

II. APPLICATION OF IoT

1. Medical & healthcare systems

IoT devices could be used to enable remote health monitoring & emergency notification systems. These health monitoring devices could range from blood pressure & heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fit bit electronic wristbands or advanced hearing aids.

The use of automation techniques to evaluate the larynx and vocal tract helps the speech specialists to perform accurate diagnosis[6].Specialized sensors could also be equipped within living spaces to monitor health & general well-being of senior citizens, while also ensuring that proper treatment is being administered & assisting people regain lost mobility via therapy as well. Other consumer devices to encourage healthy living, such as, connected scales or wearable heart monitors, are also a possibility with IoT. More & more end-to-end health monitoring IoT platforms are coming up for antenatal & chronic patients, helping one manage health vitals & recurring medication requirements.

2. Building & home automation

IoT devices could be used to monitor & control mechanical, electrical & electronic systems used in various types of buildings (e.g., public & private, industrial, institutions, or residential) in home automation & building automation systems.

3. Transportation

The IoT could assist in integration of communications, control, & information processing across various transportation systems. Application of IoT extends to all aspects of transportation systems (i.e. vehicle, infrastructure, & driver or user). Dynamic interaction between these components of a transport system enables inter & intra vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistic & fleet management, vehicle control, & safety & road assistance.

4. Large scale deployments

There are several planned or ongoing large-scale deployments of IoT, to enable better management of cities & systems. For example, Songdo, South Korea, first of its kind fully equipped & wired smart city, is near completion. Nearly everything in this city is planned to be wired, connected & turned into a constant stream of data that would be monitored & analysed by an array of computers with little, or no human intervention. Another application is a currently undergoing project in Santander, Spain. For this deployment, two approaches have been adopted. This city of 180,000 inhabitants, has already seen 18,000 city application downloads for their smart phones. This application is connected to 10,000 sensors that enable services like parking search, environmental monitoring, digital city agenda among others. City context information is used in this deployment so as to benefit merchants through a spark deals mechanism based on city behavior that aims at maximizing impact of each notification.

With wireless network in place, NY Waterway is able to take control of its fleet & passengers in a way that was not previously possible. New applications could include security, energy & fleet management, digital signage, public Wi-Fi, paperless ticketing & others.

5. Unique addressability of things

The original idea of Auto-ID Center is based on

RFID-tags & unique identification through Electronic Product Code however this has evolved into objects having an IP address or URI.

An alternative view, from world of Semantic Web focuses instead on making all things (not just those electronic, smart, or RFID-enabled) addressable by existing naming protocols, such as URI. The objects themselves do not converse, but they may now be referred to by other agents, such as powerful centralized servers acting for their human owners.

The next generation of Internet applications using Internet Protocol Version 6 (IPv6) would be able to communicate with devices attached to virtually all human-made objects because of extremely large address space of IPv6 protocol. This system would therefore be able to scale to large numbers of objects envisaged.

A combination of these ideas could be found in current GS1/EPCglobal EPC Information Services (EPCIS) specifications. This system is being used to identify objects in industries ranging from aerospace to fast moving consumer products & transportation logistics.[3]

III. BLOCK DIAGRAM
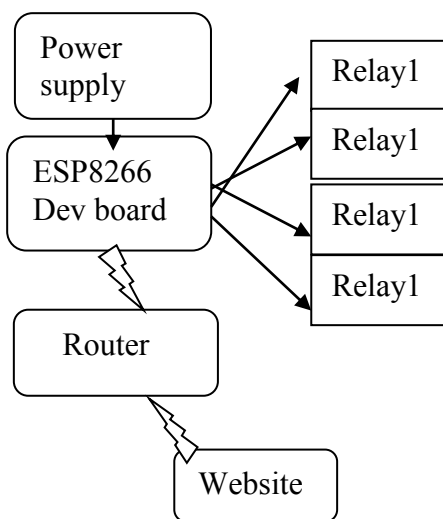
Figure 1. Home Automation system

The proposed model of the home automation system is as shown in the fig.1 above this model consist of power supply, esp8266 dev board, relay module, and modem.

in this model esp8266 offers a complete and self-contained Wi-Fi networking solutions; it can be used to host the application , when esp8266 hosts the application, it boots up directly from an external flash. It has integrated cache to improve the performance of the systems in such application. Alternatively, serving as a WIFI adapter, wireless internet access can be added to any microcontroller based design with simple connectivity (SPI/SDIO or I2C/UART interface).

Besides the WIFI functinalities.ESP8266 is often integrated with external sensors and other application specific devices through its GPIOs.
Some features of esp8266

- 802.11b\g\h
- integrated low power 32bit MCU
- integrated TCP\IP protocol stack
- integrated 10bit ADC
- WIFI 2.4GHz,support WPA\WPA2[4].

Here esp8266 dev board is controlled by a basic website which is designed using PHP and HTML. This website consists of two pages.

IV. CONCLUSION

In some cases there may be handicapped people in house and they are not able to move frequently for controlling appliances in house, so using home automation system these people can easily control all the appliances. For handicapped people it is quite fruitful to develop home automation system which requires less and easy

user interaction.

Home automation system also improves the standard of living and provides easy, flexible and interactive user interface. To provide all functionalities in low cost and flexible environment we need to apply modern technology and devices.

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"A Review on Noise Removal Using Modified Global-Local Filters"

Akanksha C. Thawale[1], Ruhina Quazi[2]
[1]Student, M-Tech Electronics and Communication, RTMNU, ACET, Nagpur, Maharashtra, India
[2]Assistant Professor, Electronics and Communication, RTMNU, ACET, Nagpur, Maharashtra, India

ABSTRACT

This review summarizes the current research works made in the field of removing salt and pepper noise or impulse noise using filters. In this work, we can reduce Salt and Pepper noise using median filter and Improved Progressive Switching Median Filter (IPSMF). It also highlights the comparable results between mean and median filter. It gives a review on current research works, considerable prospects for the future, and discusses the issues most important for further enhancement in the filters for removing noise and applications.

This paper is a survey of various novel algorithms to get better Peak Signal-to-Noise Ratio (PSNR), Mean Square Error (MSE) and Structural similarity (SSIM). This survey mainly focuses on removing noise using filters.

Keywords: Impulse noise, Peak Signal-to-Noise Ratio (PSNR), Mean Square Error (MSE), mean filter, median filter, Improved progressive switching median filter (IPSMF).

I. INTRODUCTION

Background: The available literature shows many methods based on mean and median filters employed for removal of impulse noise. There are many variants in median filter such as Standard Median Filter (MF), Adaptive Median Filter (AMF), Switching Median Filter (SMF), Progressive switching median filter (PSMF). So this concept was then actually introduced and was called Improved progressive switching median filter (IPSMF).

Introduction to noise: Noise is basically an undesired information that affects the quality of signals and data. Noise is always present in digital images during image acquisition, coding, transmission, and processing steps. The most common type of noise is salt and pepper noise which is a subtype of impulse noise. In case of salt and pepper noise, the corrupted pixels will take either gray value 255(Salt) or gray value 0(Pepper). In order to remove noise from the noisy images, different filters have been proposed.

Among different filtering techniques proposed to remove impulse noise in digital images, the most common filter used in removing impulse noise is median filter. The main idea of the median filter is to run the filter window pixel by pixel, replacing each pixel with the median of pixels in the window.

Figure 1. Noise removal workflow

Applications: This improved progressive switching median filter (IPSM) can enhance progressive median filter in terms of its noise filtering ability. The main aim of the filtering is to eliminate outliers with maximum signal distortion to the recovered noise free image. The algorithm sets a limit on the number of good pixels used in determine median and mean values, and substitute impulse pixel with half of the value of the summation of median and mean value.

II. NOISE REMOVAL USING DIFFERENT FILTERS

A noise removal technique can be done by using mean filter, median filter, progressive switching median filter (PSMF) and improved progressive switching median filter (IPSMF) depending upon the analysing parameters Mean Squared Error (MSE), Peak Signal-to-Noise Ratio (PSNR), Structural Similarity (SSIM) and Impulse noise.

Analysing Parameters:

1. Impulse Noise:-

Impulse noise is random variation of brightness or colour information in images, and is usually an aspect of electronic noise. Impulse noise corruption is very common in digital images. Impulse noise is always independent and uncorrelated to the image pixels and is randomly distributed over the image. For an impulse noise corrupted image all the image pixels are not noisy, a number of image pixels will be noisy and the rest of pixels will be noise free.

2. Mean square error (MSE):-

The MSE symbolizes your cumulative squared mistake relating to the compacted along with the unique image.

Where, f represents the matrix data of our original image, g represents the matrix data of our degraded image, m represents the numbers of rows of pixels of the image and i represent the index of that row, n represents the number of columns of the pixels of the image and j represents the index of that column.

3. Peak-Signal-to-Noise-Ratio (PSNR):-

PSNR is the ratio between the maximum possible power of a signal and the power of corrupting noise that affects the fidelity of its representation. It is expressed in terms of the logarithmic decibel (db). PSNR is most commonly used to measure the quality of reconstruction of lossy compression codecs (e.g., for image compression). PSNR is most easily defined via the mean squared error (MSE).

$$
\begin{aligned}
PSNR &= 10 \cdot \log_{10}\left(\frac{MAX_I^2}{MSE}\right) \\
&= 20 \cdot \log_{10}\left(\frac{MAX_I}{\sqrt{MSE}}\right) \\
&= 20 \cdot \log_{10}(MAX_I) - 10 \cdot \log_{10}(MSE)
\end{aligned}
$$

4. Structural Similarity (SSIM):-

It is a method for predicting the perceived quality of digital television and cinematic pictures, as well as other kinds of digital images and videos. It is used for measuring the similarity between two images. SSIM is designed to improve on traditional methods such as peak signal-to-noise ratio (PSNR) and mean squared error (MSE).

$$SSIM(X,Y) = \frac{(2\mu_x\mu_y+c_1)(2\sigma_{xy}+c_2)}{(\mu_x^2+\mu_y^2+c_1)(\sigma_x^2+\sigma_y^2+c_2)}$$

Where µx is the average of x,

µy is the average of y,

σ_r^2 the variance of x

σ_y^2 the variance of y

σ_{xy} the covariance of x and y,

c1= (k1 L)² and c2= (k2 L)² two variables to stabilize the division with weak denominator,

L the dynamic range of the pixel-value

In the paper [1], Jayanta Das, Bhaswati Das, Jesmine Saikia and S.R.Nirmala proposed a method for the restoration of gray scale images that are highly corrupted by salt and pepper noise. In this filter at first the noisy pixel is identified and then it is replaced by a suitable value. Here the size of the window automatically increases until it gets its suitable median value to replace the noisy pixel. This proposed algorithm shows better results than the standard median filter (MF), weighted median filter (WMF), switching mean median filter (SMMF) and bilateral filter.

The result demonstrated selective adaptive median filter performs better than median based filters. Even at a very high noise density (80%) the texture, details and edges are preserved to an acceptable level. The combination of bilateral filter and adaptive median filter may also be considered.

Raghuram Kunsoth and Mantosh Biswas [2], proposed method that follows Decision Based Median Filter (DBMF) that considers only the noisy pixels and replaces the pixel value with median value of the pixels present in the processing

window and increase the window size as per the requirement.

Evaluation is done based on the PSNR and SSIM values and the method works extremely well even with high noise density and deals with poor quality images even when all the pixels are corrupted in small window preserving as much image details as possible.

Paper [3], Pei-Eng Ng and Kai-Kuang Ma proposed a switching median filter incorporating with a powerful impulse noise detection method, called the boundary discriminative noise detection (BDND) for effectively de-noising extremely corrupted images.

The result demonstrated that the performance delivery is mainly due to highly accurate noise detection accomplished by the BDND algorithm—achieving zero miss-detection rate up to 70% noise density corruption while maintaining a fairly low false-alarm rate. Together with additional improvements contributed from the post-detection filtering stage, the entire switching median filtering performance has yielded a very close performance to that of the ideal-switching case consistently.

In the novel framework [4], Mr.N.Krishna Chaitanya and Mr.P.Sreenivasulu proposed a Advanced Modified Decision Based Unsymmetric Trimmed Median Filter (AMDBUTMF) for removing salt & pepper noise from high density salt & pepper noisy images. The performance of AMDBUTMF is analysed by using various metrics such as Mean Square Error (MSE) and Peak Signal-to-Noise Ratio (PSNR).

The result demonstrated that the proposed method is much better in removing the noise with high

density compared with the existing methods in terms of PSNR and MSE. This method is also applicable for another type of noises like speckle, Gaussian, random etc.

This paper [5], Archana Singh, Sanjana Yadav and Neeraj Singh proposed a concept of contrast enhancement using the global mean of entire image and local mean of 3x3 sub images. Local mean filter is used to smooth the image by taking the mean value of the pixels surrounding the center pixel within the image.

The proposed method combines global information as well as local information of the input gray images in order to enhance them. In this method, mean filter is also used that removes artifacts existing within the images. The result is demonstrated by applying this concept on number of real time images.

Research work in paper [6], Zhou Wang and David Zhang proposed a new median-based filter which is a progressive switching median (PSM) filter, which is used to restore images corrupted by salt–pepper impulse noise.

The algorithm is developed by the following two main points:
1) switching scheme—an impulse detection algorithm is used before filtering, thus only a proportion of all the pixels will be filtered
2) progressive methods—both the impulse detection and the noise filtering procedures are progressively applied through several iterations.

In the novel research paper [7], Soon Ting Boo, Haidi Ibrahim and Kenny Kal Vin Toh proposed a method to improve the PSM filter, an improved progressive switching median filter (IPSM) is proposed to enhance progressive median filter in term of its noise filtering ability. The algorithm sets a limit on the number of good pixels used in determine median and mean values, and substitute impulse pixel with half of the value of the summation of median and mean value.

The result illustrated that Improved Progressive Switching Median (IPSM) filter performs better restoration compared to Progressive Switching Median (PSM) filter, particularly for highly corrupted images. The performance of IPSM is almost equal to PSM when the image is corrupted with low level of impulse noise. This is because of the redundancy of good pixels in images corrupted with low-level of impulse noise.

In novel work [8], S. Esakkirajan, T. Veerakumar, Adabala N. Subramanyam, and C. H. PremChand proposed an algorithm which replaces the noisy pixel by trimmed median value when other pixel values, 0's and 255's are present in the selected window and when all the pixel values are 0's and 255's then the noise pixel is replaced by mean value of all the elements present in the selected window. This proposed algorithm shows better results than the Standard Median Filter (MF), Decision Based Algorithm (DBA), Modified Decision Based Algorithm (MDBA), and Progressive Switched Median Filter (PSMF).

The result illustrated that MDBUTMF is better in terms of its performance when it is compared with MF, AMF and other existing noise removal algorithms in terms of PSNR and IEF. Even at high noise density levels the MDBUTMF gives better results in comparison with other existing algorithms.

In this novel research paper [9] Thomas A. Nodes and Neal C. Gallagher proposed some modifications in median filter. It is also shown that for non-median nth ranked-order operations, repeated application of the operation will reduce any signal to a constant. Also it is proved that the output of a recursive median filter is invariant to subsequent passes by the same filter.

It is examined for several variants of the median filter and have proven many of their properties. All of the properties are based on finite length signals with constant appended endpoints of values equal to the values of the respective endpoints of the signal. It was also found that the set of nth ranked-order operations is a generalization of the median filter, and that they all have many similar characteristics.

T. Loupas, W. N. Mcdicken, and P. L. Allan in paper [10] proposed a method for reducing speckle noise in medical ultrasonic image and the method used for such noise reduction is called as AWMF (Adaptive Weighted Median Filter). It is based on the weighted median, which originates from the well-known median filter through the introduction of weight coefficients. By adjusting the weight coefficients and consequently the smoothing characteristics of the filter according to the local statistics around each point of the image, it is possible to suppress noise while edges and other important features are preserved.

The result demonstrated that the filter combines the edge-preserving properties of the WMs with the space-varying implementation based on the local image characteristics to reduce significantly the speckle with negligible loss of genuine image detail.

The centre weighted median (CWM) filter is a weighted median filter giving more weight only to the central value of each window. This filter can preserve image details while suppressing additive white and/or impulsive-type noise. In this paper [11], it is an attempt to improve the performance of CWM filters, so a new improved adaptive CWM (ACWM) filter having a space varying central weight is proposed.

The CWM and ACWM filters are useful detail preserving smoothers, were proposed and their properties were analyzed. ACWM filters can suppress multiplicative noise as well as additive white and impulsive noise.

In this framework [12], a new impulse noise detection technique is presented for switching median filters. This technique is based on the minimum absolute value of four convolutions obtained using one-dimensional Laplacian operators. This filter provides better performance than many of the existing switching median filters.

From the result it is illustrated that this filter prevents removal of fine details such as lines from images and thus it provides improved impulse detection ability. The proposed method is better than many of the existing filters in terms of their simulation and computational complexity analysis.

K. S. Srinivasan and D. Ebenezer proposed a new decision based algorithm in paper [13], for restoration of images that are highly corrupted by noise. Unlike other non-linear filter, the proposed method removes only corrupted pixel by the median value or by its neighbouring pixel value.

From result it is demonstrated that the proposed filter exhibits better in comparison with SMF, AMF,

and TD filters in terms of higher PSNR and IEF. This performance of this filter is consistent and stable across a wide range of noise densities varying from 10%–90%. Effective noise removal can be observed even up to 90% noise density level, while edges are preserved up to 80%.

A method for removing salt-and-pepper impulse noise in two phase scheme is discussed in the paper [14]. In the first phase, an adaptive median filter is used to identify pixels which are likely to be contaminated by noise. In the second phase, the image is restored using a specialized regularization method that applies only to those selected noisy pixels.

Experimental results show that this method performs much better than median-based filters or the edge preserving regularization methods. The texture, details, and edges are preserved accurately even at very high noise.

III. APPLICATIONS AND FUTURE SCOPE

Median filters are known for their capability to remove impulse noise as well as preserve the edges, so in future we can use advanced median filter which can be called as progressive switching median filter which will works in two stages. This filter implements a noise detection algorithm before filtering. But the disadvantage to use PSM is that it removes both the noise and the fine detail since it cannot tell the difference between the two. So it is an attempt to improve the PSM filter, and an Improved PSM filter can be proposed.

IV. CONCLUSION

In this paper we have given an introductory survey for removal of noise from images using different filters. Among all filters, progressive switching median filter is advantageous to be used because of its ability that it can restore images that are corrupted by salt-pepper impulse noise.

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"Design Andimplementationof Smart Energymeter Using Internet of Things (Iot)"

Umesh Parve[1], Tirupati.M. Goskula[2]
[1]Student, Electronics and communication, RTMNU, Nagpur, Maharashtra, India
[2]Assistant Prof.,Electronics and Telecommunication, RTMNU, Nagpur, Maharashtra, India

ABSTRACT

The IoT based Smart and many function Energy Meter for Automatic Meter Reading using ATmegha kit. It has provision of connecting with Central database maintained by energy provider using computing as well as Tampering detection of energy meters. which can prevent theft detection from unregisterd users saving losses due to it. Remarkable feature of this meter is Internet of Things based implementation According to the market requirements of ATmegha Meter there is use for smart. ATmegha Meter. Nowadays the system will use Wireless system for communication protocol. The Wireless is used since the application need high speed data rate, need to be less powered with low cost. In this paper presenting the remote wireless ATmegha Meter Reading System. This is to resolving the shortcomings of the technology of the traditional ATmegha Meter Reading, by combining the characteristics of the Wireless technology and with Microcontroller ATMega16. The hardware implementation was designed, and then analyzed the use cases for ATmegha Meter. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources. It requires so many workers, one set of workers to note down the reading and other set to cut the power if the payment is not paid at the right time.
Keywords: ATmega, Microcontroller, Internet Of Things. etc.

I. INTRODUCTION

In the Internet of Things, many of the living and non-living things that encompass us will be on the internet in one form or another. Driven by the popularity of gadgets empowered by wire-less technological innovation such as Wireless Bluetooth, Radio Frequency Identification, Wireless-Fidelity, embedded sensor, IoT has moved out from its beginning stage and it is actually on the edge of changing the present fixed inter-net into a well featured upcoming Internet. Currently there are almost nine billion inter-connected gadgets and it is estimated to touch almost fifty billion gadgets by 2020. Today the world is facing such an environment that offers challenges. Energy crisis is the main problem faced by our society. A relevant system to control and monitor the power usage is one of the solutions for this problem. One approach through which today's energy crisis can be addressed is through the reduction of power usage in households. The consumers are increasing rapidly and also burden on electricity offering divisions is sharply increasing. The consumers must

be facilitated by giving them an ideal solution Embedded systems and Real Time Operating systems (RTOS) are two among the several technologies that will play a major role in making these concepts possible [2]. A large number of people are already depending on operating systems for real time applications, these 'eyes in the sky' are now going to make an impact on our everyday s in a more significant manner. Embedded systems are pre-designed without connections and operate as per the required task. But in operating systems instruction is design-oriented. These systems are basically platform-less systems. Embedded systems are the unsung heroes of much of the technology we use today the video game we play, or the CD player or the washing machines we use employ them. Without an embedded system we would not even be able to go online using modem Almost every car that rolls off the production line these days makes use of embedded technology in one form or the other; most of the embedded systems in automobiles are rugged in nature, as most of these systems are made up of a single chip. No driver clashes or 'systems busy' conditions happen in these systems. Their compact profiles enable them to fit easily under the cramped hood of a car. These systems can be used to implement features ranging from adjustment of the suspension to suit road conditions and the octane content in the fuel to antilock braking systems (ABS) and security systems. Embedded systems are designed to do some specific task, rather than be a general-purpose computer for multiple tasks. Some also have real time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs.

II. LITERATURE SURVEY

1. **Dong Chen, Student Member, IEEE, Sandeep Kalra, Student Member, IEEE, David Irwin, Member, IEEE Prashant Shenoy, Fellow, IEEE, and Jeannie Albrecht, Member, IEEE "Preventing Occupancy Detection From Smart Meters" IEEE TRANSACTIONS ON SMART GRID 2015**

Utilities are rapidly replacing existing electromechanical meters, which are read manually once a month, with smart meters that transmit a building's electricity usage every few minutes. In 2011, an estimated 493 utilities in the U.S. had collectively installed more than 37 million smart meters .Unfortunately, smart meters also indirectly leak private, and potentially valuable, information about a building's occupants' activities. To extract this information, third-party companies are now employing cloud-based, "big data" platforms to analyze smart meter data en masse. While the purpose is, ostensibly, to provide consumers energy-efficiency recommendations, companies are mining the data for any profitable insights. For example, detecting power signatures—sequences of changes in power unique to a device—for specific appliance brands could aid manufacturers in guiding their marketing campaigns, e.g., identifying homes with General Electric versus Maytag appliances . Many utilities are providing third-party companies access to troves of smart meter data. For instance, a recent report highlights one utility's practice of requiring its customers to consent to sharing their data with third parties before permitting them to use an online web portal [9]. Such privacy violations have led to a small, but growing, backlash against smart meter deployments

2. Md. Masudur Rahman; Noor-E-Jannat; Mohd. Ohidul Islam; Md. Serazus Salakin "ATmegha and GSM Based Smart Energy Meter for Advanced Metering and Billing System" IEEE 2015 978-1-4673-6676-2115

Every management system is trying to make automatic, portable and remote control. This work presents a novel smart energy meter for an automatic and superior metering and billing system. The integration of the ATmega and GSM Short Message Service (SMS) provide the meter reading system with some automatic functions that are predefined. Firstly, we have simulated the project in PROTEUS 8.0 then successfully implemented on the circuit board in laboratory. The proposed energy meter system can incorporate with embedded controller and GSM modem to transmit the data like consumed energy in kWh, generated bill, security services (line Cut/On) over GSM mobile network such as data can be then fed and integrated into existing energy management systems located at power companies or organizations to provide the services among the customers without man-power. Our implemented project is able to provide all required services remotely for metering and billing with high fidelity

3. Hung-Cheng C HEN, Long-Yi CHANG National Chin-Yi University of Technology "Design and Implementation of a ZigBee-Based Wireless Automatic Meter Reading System"

ZigBee is a new global standard for wireless communications with the characteristics of low-cost, low power consumption, and low data rate. It has a good market in wireless meter reading. The design and implementation of a ZigBee-based wireless automatic meter reading system are proposed in this paper. The experimental results show that the design can meet the basic needs of automatic meter reading with flexibility and expansibility. It can act as a platform of wireless monitor system and supplies a new hardware design approach for wireless ZigBee networks.

With the rapid development of automation and measuring techniques, automatic recording of the data in the meter reading instrument has gradually become the target of people whose working, living, and home conditions are of increasingly high level of intelligence. Meanwhile, utilities also hope that the development of new technologies to solve the problems they encountered in the practical work about cumbersome meter reading and no reliable protection of accuracy and real time; and enable both user friendly and improving public sector efficiency and management level. Existing wire-line meter reading system has a large number of risks. Wires are more complex, detrimental to adjustment and maintenance of the system. The long-term indoor and outdoor installation easily leads to aging, resulting in a risk of short circuit and breakage. For these reasons, it has become the industry very unresolved problem to design a remote meter reading system, with long-term reliance and convenient installation & maintenance, which not only read data automatically but also monitor operation status. With the development of wireless communication technology, in recent years there comes requirement for low cost equipment of wireless networking technology, called ZigBee. It is a short range, low-complexity, low cost, low power consumption, low data rate two-way wireless communication technology with high network capacity, short time delay, safety and reliance. Its main application areas include industrial controls, consumer electronics, car automation, agricultural automation, and medical equipment control. The core of this technology is established by IEEE 802.15.4 Working Group, and the ZigBee Alliance

founded in 2002 is responsible for high-level applications, interoperability testing, and marketing. Till now, the ZigBee Alliance has reached over 150 members of famous companies in the world including IBM, Ember, Mitsubishi, Motorola, and Philips, etc . Many semiconductor companies are targeting the ZigBee market. Since the standards were launched not long ago, chips in line with protocol have been available of multi-chip solution and single-chip solution. It can be expected that ZigBee will have comprehensive applications in the field of automation. The main methods of metering at home and abroad are: manual meter reading, IC Card prepaid meter, wire-line and wireless meter reading system. Manual meter reading has been for decades, but with the implementation of one home one meter, drawbacks of this method of reading are more and more, like difficult entrance to home, low efficiency of fee settlement, etc.

4. SHOEB S.SHEIKH "DESIGN AND IMPLEMENTATION OF WIRELESS AUTOMATIC METER READING SYSTEM" Department of Electronics ant Telecommunication, Nagpur University, Nagpur, Maharashtra 440030, India

Designing and implementing commercial as well as industrial systems based on Wireless communication has always been a prominent field of interest among many researchers and developers. This paper presents an implementation methodology for a wireless automatic meter reading system (WAMRS) incorporating the widely used GSM network. In many countries GSM network is widely known for its vast coverage area, cost effectiveness and also for its competitive ever growing market. Using GSM as the medium for WAMRS provides a cost-effective, wireless, always-connected, two-way data link between utility company and WAMRS, the WAMRS sends information of utility usage, power quality and outage alarm to utility company, tampering detection to the utility servers. In this paper we suggest a method where we utilize telecommunication systems for automated transmission of data to facilitate bill generation at the server end and also to the customer via SMS, Email.

The wide proliferation of wireless communication propose and explore new possibilities for the next generation Automatic Meter Reading whose goal is to help collect the meter measurement automatically and possibly send commands to the meters. Automation ranges from connecting to a meter through an interface for transmitting the meter measurements all the way from the meter to the utility company via GSM network. With the development of country's economy and the improvement of national power, the power requirement is still ever increasing due to use of improper power management systems and the conventional energy metering system. Over the past years, metering devices have gone through much improvement, and are expected to become even more sophisticated, offering more and more services. Meters in the past, and today in a few countries, were electromechanical devices with poor accuracy and lack of configurability. Theft detection was also a challenge. Such meters are limited to providing the amount of energy consumption on site. Recent developments in this direction seem to provide opportunities in implementing energy efficient metering technologies that are more precise and accurate, error free, etc. The implementation of WAMRS provides with many vital features as compared with the analog utility meter reading with man power. Some of these features are listed below,

1. Higher speed.
2. Improved load profile.
3. Automatic billing invoice.
4. Real time energy cost.
5. Load management.
6. Alarm warning.
7. Remote power switches on/off.
8. Tamper detection.
9. Bundling with water and gas.

WAMRS provides a two way communication between the Energy company and the load by sending in a lot of power parameters and control signal to reach the goal of load management and power demand control. Using WAMRS on distribution automation can supply many capabilities such as efficient meter-reading, distribution, power monitoring and control, load management and time-of-use rate. With rapid growth of mobile communication network, future application service will gradually concentrate on data transmission service

5. **Pooja D Talwar , Prof. S B Kulkarni "IOT BASED ENERGY METER READING" International Journal of Recent Trends in Engineering & Research (IJRTER) Volume 02, Issue 06; June - 2016 [ISSN: 2455-1457]**

The internet of thing allows object to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration between the physical world and computer based systems, and resulting in improved efficiency, accuracy and economic benefit. The increasing generation needs empowered gadgets by wireless technology which includes Bluetooth, Radio Frequency Identification, Embedded sensors and many more. In that IOT technology has grown from its beginning and now presently widely using

it. The electricity plays an important role in our life. Now days as the consumers are increasing rapidly it became very hard to handle the electricity requirements. Without electricity it's impossible to survive and also it is important to save the electricity loss. As the generation is increases the consumer's requirements also increasing so in accordance with it the technology improvement is needed. So we developed the system with faster and improved technology i.e. IOT. The electricity also contains some issues like power theft. Power theft is a measure crime and it also directly affects the economy of our country. Transmission, generation and distribution of electricity include the loss of electricity. To avoid the losses we need to monitor the power consumption and losses, so that we can efficiently utilize the generated power. Meter tempering is part of power theft and also illegal crime which we can minimize. Billing is a process in general the human operator goes to every consumer's home then providing bill it will take lot of time. To resolve these issues we developed system on the base of IOT energy meter reading. IOT based energy meter reading consists of three parts: Controller, Theft detection and WIFI part. Controller part plays a major role in the system. Where all the information can send through this controller to the other part of the system and it also stores the information in it. WIFI part performs IOT operation in accordance with the ATmegha controller. The energy meter connected with theft detection part if any temper happens it will send the information to the company as well as it will take automatic action by making power off.

6. **Darshan Iyer N, Dr. K A Radhakrishna Rao "IoT Based Electricity Energy Meter Reading, Theft Detection and Disconnection using PLC modem and Power optimization" DOI: 10.15662/ijareeie.2015.0407113**

The Buyer needs to pay for the usage of electricity on schedule, in case that he couldn't pay, the electricity transmission can be turned off autonomously from the distant server. The user can monitor the energy consumption in units from a webpage by providing device IP address. Theft detection unit connected to energy meter will notify company side when meter tampering occurs in energy meter and it will send theft detect information through modem and theft detected will be displayed on the terminal window of the company side. Wi-Fi unit performs the IoT operation by sending energy meter data to web page which can be accessed through IP address. The Hardware interface circuit consists of PIC18F46k22 Microcontroller, MAX232, LCD display, theft detection unit, Triac switch circuit, DB18B20 temperature sensor, PIR sensor, PLC modem, and ESP8266 Wi-Fi module. Wi-Fi unit performs the IoT operation by sending energy meter data to web page which can be accessed through IP address.

III. MOTIVATION

Stands for metering Meter Reading. A device which remotely obtain meter readings and transmits this data to the system's computer via communication media such as (RF communication module) or dedicated cables for processing. devices can detect outages, remotely connect and disconnect services, detects tampering as well as other uses. has benefits include increased cash flow, lower labor and equipment cost, increased accuracy and lower costs. Some customer satisfaction benefits include improved service quality, more customer choices and faster response time. If Home occupancy is monitored by tech savy persons, then it will be detrimental from consumer side. So, this problem motivates us to avoid this problem with our proposed system. It very difficult for energy provider company to maintain records of their consumers terms of hourly consumptions of electricity. So, it motivates us to build single Centralized database that can maintain records of their consumers electrical energy consumption hourly basis and on the analysis of that home occupancy detection can be avoided, It has become trend to integrate automatic systems via wireless applications over network which motivates us to do further advancement in this regard. Along with advancement of technology of development, research on wireless applications and remote control has become popular today. An electricity meter, electric meter or energy meter is a device that measures the amount of electric energy consumed by residence, business, or electrically powered device. So, by making it tampering proof, large amount of unwanted losses to MSEB as well as nation can be controlled. Theft detection of Electrical Energy can also be monitored through our proposed system. There is huge loss occurs to Energy provider company because of unwanted theft of electrical energy which motive us to do something in this regard. With the help of centralized database, we can monitor energy consumption of user, Technological advantages in IT infrastructure services make automated billing and paying of bills easier.

IV. RESEARCH ANAYLSIS

With the increasing population, residential, commercial, and industrial area, the consumption of electricity or utilization of power increases much rapid than the user numbers due to technologies and power dependent equipment and systems. It has now become imperative for utility companies to devise better, non intrusive, environmentally-safe techniques of gauging utilities' consumption so that the correct bills can be generated and invoices.

The benefit goes beyond the power consumption. It will also be the basis for power generation and more accurate demand forecasts which will lead to more efficient usage power distribution, power generation and minimizing raw material waste.

The smart metering system is designed to make the prevailing electricity billing system simpler and efficient. The conventional metering system is done manually. An worker of the Electricity Board will be coming to take the reading and enter in the card. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources. It requires so many workers, one set of workers to note down the reading and other set to cut the power if the payment is not paid at the right time and we have very poor servicing. Manual reading can create errors in calculation. Sometimes it happens that images taken by meter reader are not in proper manner, which leads to improper calculation of bills. This problem can be avoided with our proposed project. If bill amount is not paid by the user within specified time duration, it takes time by MSEB employee to go to that particular house and disconnect the meter until bill is not paid by the consumer. This is time-consuming task, which can be overcome by our proposed system.

We are going to achieve following objectives which are further divided into two sections.

Electrical Company Benefits:-

- To implement smart automated processes instead of manual work.
- To provide Accurate information from the network load to optimize maintenance and investments.
- To provide customized rates and billing dates.
- To streamline bill investigations.
- To detect tampering of Meters.

- To provide accurate measurement of transmission losses.
- To implement better network performance and cost efficiency.
- To provide effective demand and distribution management.
- To provide more intelligence to business planning.
- To establish better company credibility.
- To prevent theft detection from unregistered users.
- To avoid tech savy criminals to detect occupancy of consumer' s home.
- To become easier of monitoring of electrical consumption of users with the help of cloud computing.

Customer Benefits:-

- To provide precise consumption information.
- To provide clear and accurate billing.
- To provide metering outage information and faster recovery.
- To prevent theft due to occupancy detection of users home.

V. CONCLUSIONS

This paper is mainly concentrated on IOT network. First point is we converting energy meter which is about the project there are electromagnetic into a digital meter. We are doing automatic reading and also connection and disconnection of meters using wireless module. Then meter reading has come faster. It is available for the customers. The peoples will be using the information as per their requirements and they will be having freedom to check the bill, tampering, when the meter has been connected and disconnected before the due date. So concluding that we are successfully monitored the tampering seal tampering and we have read the

meter bills which also be uploaded on the website using IOT concept. Overall the new things we are worked with in our project are controller coupled with ATmegha controller and the IOT model.

Metering Meter Reading is a unique solution for problems in existing manual system. metering Meter Reading is self assured automation system. Implementation of metering Meter Reading with the help of standalone system is an innovative idea. There are more chances of manual error, delay in processing, tampering of the meter and misusage of the Electricity by other sources but with the help of metering Meter Reading, we can easily overcome this. Standalone system is most suitable to implement transfer of unit. The prepaid services, we can make proper use or storage of electricity. benefits include increased cash flow, lower labor and equipment cost, increased accuracy and less costs some customer benefits include improved service quality, more customer choices and faster response time.

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Review on Rfid Based Digital Pulse Rate Real Time Monitoring

Firdous Heena, Pranali Lokhande, Rupali Navnage, M T Hasan

Electronics & Teleco Anjuman college of Engineering & Technology Nagpur, Maharashtra, India

ABSTRACT

Care of critically ill patient, requires spontaneous & accurate decisions so that life protecting & lifesaving therapy can be properly applied. Statistics reveal that every minute a human is losing his or her life across the globe. More close in India, everyday many lives are affected by heart attacks and more importantly because the patients did not get timely and proper help .This paper is based on monitoring of patients. We have designed and developed a reliable, energy efficient patient monitoring system. It is able to send parameters of patient in real time. It enables the doctors to monitor patient health parameters in real time. Here the parameters of patient are measured continuously and wirelessly transmitted using Zigbee. The project provides a solution for enhancing the reliability and flexibility by improving the performance and patient monitoring system. In the current proposed system the patient health is continuously monitored and the acquired data is analyzed at a centralized system. If a particular patient health parameter falls below the threshold value, a . Here, we are using Zigbee for wireless transmission. The Doctor can get are cord of a particular   information by just accessing the database of the patient on his PC which is continuously updated through Zigbee receiver module.
Keywords: wirelessly transmitted, Zigbee.

I. INTRODUCTION

In recently, wireless sensor networks are used to structure Remote care system in many researches. Wireless sensor   networks application for physiological signals communication transmission has many technologies. Such as the   ZigBee, used for Physiological signal transmission. Although ZigBee has lower power consumption. Hence, ZigBee is used for 24 hours monitor of communication   transmission systems. ZigBee provides higher network flexibility and a larger number of nodes, and a better transmission range with low power consumption. Large number of nodes enables the expansion of such systems.

Recently, ZigBee based wireless networks were check in various applications. The proposed patient monitoring system would be beneficial for medical practitioners to do proper and treatment; also it would be useful for health care providers to improve disease management. The patient is monitored the data transferred to the PC is wired. Recent work [1,2] includes using Bluetooth technology coupled with the patient or his doctor. Monitoring based on ultra wideband based personal area networks was reported in [3]. Sneha and others [4] presented an architectural framework for a system that utilizes mobile techniques to wirelessly monitor patients. The work reported in [5] discusses the implementation issues, and describes

the overall system architecture of a Bluetooth sensor network for patient monitoring in [6] the authors investigate the use of ZigBee and in monitoring in patients with diabetes mellitus or heart diseases.

II. LITERATURE SURVEY

The speed of change in the medical field has been overwhelming. Groundbreaking achievements such as the discovery and development of penicillin, chemotherapy, and vaccinations have led people in the medical profession to have a great understanding of the human body [1]. The average life expectancy in the United States has increased from 47.3 years in 1900 to 68.2 years in 1950 to 77.3 years in 2002 [2,3]. With such a high and continued increasing average life expectancy rate, medical care for senior citizens, age 65 and over, is becoming progressively more important. The evolution of wireless technology is also extremely fast-paced. The 802.11b protocol for wireless computer networks came in large demand in 2000. In just over four years, wireless communications technology has become readily available for the general public, with 7.5 million households in the U.S. using some form of a wireless network [4]. The benefits of wireless technology are already apparent: portability, convenience, ease of installation, and low cost. What if wireless and medical sensor technology were combined? In this paper, we discuss the design of a wearable device that can remotely monitor vital signs of users. This device is implemented using existing technologies. The information from this device is sent to a base station which is connected to a computer. The information will be received by medical personnel and/or family members. Several patients may be monitored from a single base station. The system is designed so that it is easy to use and set up

in medical facilities (such as hospitals) and residences.

One of the early works on health care monitoring system has been proposed in [6]. The proposed system is suitable for patients, senior citizens, and others who need continuous monitoring of their health. The proposed system can monitor the ECG signals of a patient based on Session Initiation Protocol (SIP) and a ZigBee network. The system consists of a wireless ECG sensor, ECG console, ZigBee module, SIP register, a proxy server, a database server, and wireless devices. Simultaneous monitoring of the biomedical signals from multiple patients has been addressed in

[7]. The proposed network is based on IEEE 802.15.4 standard and the ZigBee technology. The authors have proposed an optimized source routing protocol to control the network load. Some other issues including energy consumption, network lifetime, and delivery ratio have also been addressed in the same work.
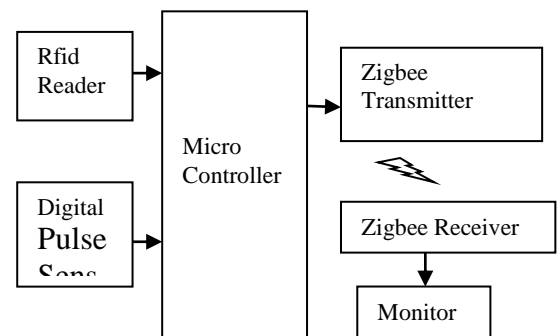
Figure 1. Block Diagram

III. IMPLEMENTATION METHODOLOGY

Since the dawning of the age of electronics, countless attempts have been made to convince the medical profession of the advantage of amplifying hearts sounds with the idea that if the sound level could be increased a greater diagnostic capability

might be achieved. the heart sound heard by the physician through his conventional stethoscope occur at the time of closure of major valves in the heart. In an abnormal heart additional hearts sounds. Murmurs are heard between the normal sounds . Murmurs are generally caused either by improper opening of the vales or by opening in the septum, which separates the left and the right side of the heart. Different physicians may hear the same sound but interpret them differently. This could lead to faulty diagnosis.

In addition high fidelity equipment would be able to reproduce the entire fidelity equipment would be able to reproduce the entire frequency range much of which is missed by the ordinary stethoscope. The instrument that has been developed in order to utilise the entire sound spectrum with high fidelity is the digital stethoscope from heart by means of suitable hardware. The extracted signal is feed to computer to detect for abnormalities of the heart if any Measurement of physiological parameters like heart rate and respiration rate crucial in the field of medicine. Advances in technology have provides different measurements for constantly monitoring Here is a simple method for respiration rate measurement using a displacement transducer. This meter can be used to monitor the respiration rate, pulse rate (by using a proper sensor) and heart rate. It responds fast and is cost-effective compared to conventional medical equipment. By using this, respiration rate can be measured in the range can be measured in the range of 0-999 respirations/minute.

IV. CIRCUIT DESCRIPTION

The respiration rate meter. It uses a displacement transducer for sensing the respiration rate using IR

transmitter and receiver as shown in the physical assembly. Inhaling and exhaling the air during respiration leads to move of a lightweight ball (made of thermocal) up and sown in a capillary glass tube. This movement is sensed with the help of IR transmitter-receiver assembly of the sensing circuit and converted into pulses through the pulse generator. These pulses are counted for a minute using a counter. Start switch s1 is used to reset the display to zero and enable the counter for a minute to count the respiration pulse. The gate pulse generator consists of a monostable consists of a monostable multivibrator. When triggered by start switch, it generates gating pulse of one minute duration.

The circuit of the respiration rate meter. The IR transmitter LED (IRTX) connected in series with resistor R1 transmits IR signals, which are received by the IR receiver Led (IRTX).The IR receiver is connected to the base of transistor T1 through resistor R2. When the transmitter IR signal fails directly the reverse biased IR diode, it produces an electrical signal according to the IR intensity. So transistor T1 conducts and its collector goes low, which makes transistor T2 becomes high, which represent logic'1'. When the IR signal from the transmitter is interrupted sue to movement of the ball up and sown during the bale-exhale mechanism, transistor T1 is cut-off and its collector goes high, which drives transistor T2 into conduction. The collector of transistor T2 goes low, which represents logic '0'. This means whenever the ball crosses the IR beam, a pulse is generated during in bale and exhale. IR emits the rays amplified by transistor and generated by 555 timer. TSOP sense the signal and sends to the transistor Which has 555 timer sends to the microcontroller will has the programming which sends to decoder which trigger the relay Through which it will

trigger the relay ON. certain frequency and ignores all other IR received. The best frequency for the job is between 30 and 60kHz, the most used is around 36kHz. So, remote controls use the 36kHz (or around) to transmit information. Infra Red light emitted by IR Diodes is pulsated at 36 thousand times per second, when transmitting logic level "1" and silence for "0". To generate a 36kHz pulsating infrared is quite easy, more difficult is to receive and identify this frequency. This is why some companies produce infrared receives, that contains the filters, decoding circuits and the output shaper, that delivers a square wave, meaning the existence or not of the 36kHz incoming pulsating infrared.
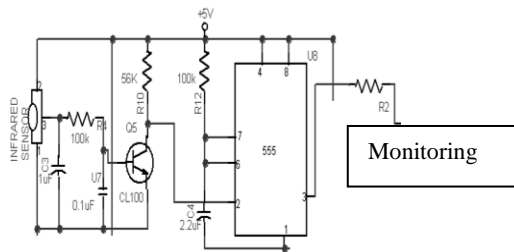
Figure 2. Pulse rate Detection Circuit

V. CONCLUSION

For computerizing the working in a hospital. The software takes care of all the requirements of an average hospital and is capable to provide easy and effective storage of information related to patients that come up to the hospital. It generates test reports; provide prescription details including various tests, diet advice, and medicines prescribed to patient and doctor. It also provides injection details and billing facility on the basis of patient's status whether it is an indoor or outdoor patient. The system also provides the facility of backup as per the requirement.

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A Review on Influence of Manufacturing Waste (Carbon Black) on Properties of Concrete

Md Amir Raza[1], Afroz Vakil[1], Naziya Anjum[1], Tanveerul Gani[1], Prof Aquib Ansari[2]
[1]UG Student, Civil Engg. Department, ACET, Nagpur, Maharashtra, India
[2]Assistant Professor, Civil Engg. Department, ACET, Nagpur, Maharashtra, India

ABSTRACT

From the beginning, concrete has been an essential building material in the construction industry. This concrete contains pores and micro-cracks which lead to less resistance of atmospheric attacks and acid intrusions. This can be resolved by making concrete denser by adding filler which will decrease permeability and increase durability and strength of concrete. So, an experimental attempt is made to fill these pores in concrete by adding Carbon Black Powder, obtained from waste of rubber industry which acts as filler in concrete. This paper presents a review of all such authors who had used

To suggest the optimum percentage of carbon black to be added in concretes with carbon black of different percentage were cast. A comparison of strength is made between conventional and non-conventional concrete blocks. It is observed that the strength gets dramatically increased with the addition of filler in the concrete and hence shows good performance in durability with addition of Carbon Black in the concrete. This paper presents a review of all such authors who had used Carbon Black in various forms for to determine its optimum doses and its various properties.

Keywords: Carbon black as a filler, Compressive strength

I. INTRODUCTION

Concrete is a composite material and is a vital material in construction industry. An ordinary concrete is composed by cement, aggregates and water in appropriate proportions. It is a porous material which contains air voids, capillary pores and gel pore of various sizes hence affects the property of concrete by intrusion of various acids and atmospheric attacks which makes the concrete weak. Moreover, the presence of pores decreases the compressive strength of the concrete.

To mitigate this problem, its determined that making the concrete denser by using filer to fill its pores. One of the filler that can be used and is eco-friendly is Carbon Black. Carbon black is a waste material which is obtained from rubber industries as rubber waste. It is in the form of colloidal particles whose particle size range from 8 nano meters to 100 nanometers. Its formation in huge amount creates problems in disposal and when it gets mixed with soil, it reduces its properties. It also contaminates the water which leads to water pollution. Specific gravity of carbon black was computed by density bottle method and it was

found to be 1.29 pH and it was determined to be 6. by this it is considered as utmost inert material.

The use of carbon black is effective as small size particles fill the pores in concrete and making it denser. Hence, we can say that use if carbon black as pores fillers in concrete reduces this problem effectively.

Figure 1. Carbon Black in powder form

II. LITERATURE REVIEW

1. Dr. G. Chitra, P. Vetri Selvi and Dr. D. Vijayalakshmi (2014)

In this paper authors included Carbon Black as an Additive in Conventional Concrete. Addition of carbon black beyond 8% is found to be not effective which was seen from the reduction of the performance of 12% and 15% samples. It was concluded that the addition of Carbon Black up to 5% as a filler will be very effective in concrete. Moreover, addition of 8% Carbon Black in the concrete shows excellent closure of pores and for water absorption.

2. Gaurav Navnit Nagavkar (2017)

Author studied the effect on properties of concrete with partial replacement of additives with cement. Additives used were Carbon Black in varied percentages. It was observed that the addition of waste material and other admixtures in cement concrete enhances the compressive, tensile and flexure strength on the other hand it also makes concrete more economical and eco-friendly.

3. B. Padma Priya, Mrs. K. Pandeeswari (2016)

Author investigated the effects of compressive strength of concrete by addition of Carbon Black up to 30%. Carbon Black was replaced by cement and proved to give higher value of compressive strength. The addition of PET (Polyethylene Terepththalate) lowered the strength of concrete and hence Carbon Black was added in order to increase the strength.

4. Perviz Ahmedzade and Tacetinn Geckil (2017)

The effect of carbon black on mechanical and electrical properties of asphalt mixture was investigated by the authors. Marshal stability test, creep stiffness, indirect tensile modulus and indirect tensile strength test were performed. Based on the value best result were obtained from the mixture with carbon black as filler. Result of investigation shows that carbon black improves both mechanical and electrical conductivity of asphalt mixture

5. M.H Kharitas Yousef And M. Alnassar,(2008)

To investigate the shielding property carbon powder was added to concrete made of hematite aggregate. Carbon powder was added in different percentage and it was found that the result of 6% (by wt) of concrete could increase the strength by 15% and shielding effectiveness decrease for gamma and neutron with adding more percentage of carbon powder.

6. A. Goldman And A. Bentur (1993)

Author replaced Silica fumes by carbon black as alternate micro filler. Result indicated that Carbon Black is effective in modifying basic concrete matrix strength to an extent similar to silica fumes

7. Sami Masadeh (2015)

Corrosion of steel reinforcement was studied after adding carbon black in concrete mix. It was achieved by inserting steel reinforcement in different concrete with different carbon black percentage. And sample was immersed in 3.5% chloride solution for next 6 month. It was observed that the corrosion rate decrease with increase in

carbon black percentage by making the concrete dense.

III. CONCLUSION

Based on literature review it can be concluded that

- ✓ Carbon black proves as an excellent additive from which higher compressive strength can be obtained.
- ✓ Carbon Black proves as good filler and fills the pores thereby making the concrete dense.
- ✓ Replacing Carbon black by 8% with cement proved to give better results than that of convention concrete at the same grade.
- ✓ Using Carbon Black as a filler and replacing it by 30% gave positive compression results.
- ✓ Strength of concrete containing Carbon Black in a specific % is at par with that of conventional concrete.

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"Design of Duct for Air Cooling System"

Anupam Kumar, Aakib Anwar, Amir S. , Junaid Khan, Sohail N. S. , Md. Faizan
Department of Mechanical Engineering, Acet, Nagpur, Maharashtra, India

ABSTRACT

This paper focus on study of design of duct for air cooling system in which all air flow features related to the duct system efficiency. Adequate tools and methods are required to design the air cooling duct system. For the purpose of designing a ducting system, we first collected the dimensions of our class room and decided upon the various instruments that can be used as well as available to fulfil our purpose. Our concentration was manly towards the efficiency of the design, while giving highest priority to uniform distribution of cooling air and minimizing the pipe friction loss. After a series of calculation and designing the outcome was a possible solution for an optimum ducting system for our class room. This paper will be study about velocity distribution of air in the duct at various sections, pressure difference at various outlets and distribution of air flow for different load conditions.

Keywords: Air duct, Mech. Building, Heat load, Duct design, velocity method

I. INTRODUCTION

Earlier the use of air cooling duct for comfort purpose was considered a luxurious but now-a-day, it has been a necessity in extreme climatic conditions, such as extreme cold and hot in western countries. Window air cooling duct are preferred for office rooms while large centralized units are installed for cooling the auditorium, hospitals etc.

The correct estimation of cooling load of large area is very complicated due to many factors such as outdoor temperature, humidity, air leakage into the conditioned space. The Climate condition at workplace like offices, hotels, workshops are also important factor While selecting the optimum design for cooling duct. Which results in comfort condition.

A normal healthy person feels comfortable at 25°C DBT, 50% RH with 9 to 12m/min air velocity. Human comfort is influenced with the physiological conditions determined by the internal heat generation. Ducts are used in heating, ventilation, and air conditioning (HVAC) to deliver and remove air. These needed airflows include, for example, supply air, return air, and exhaust air. Ducts also deliver, most commonly as part of the supply air, ventilation air As such, air ducts are one method of ensuring acceptable indoor air Quality as well as thermal comfort. Ducts can be further used to transfer cooled air for long distances. The main objective of our project is to provide efficient air cooling.

Theory

Cooling Load Temperature Difference(CLTF), Cooling Load Factors is used to calculate the cooling load of building. The conditioned air (cooled or heated) from the air conditioning equipment must be properly distributed to rooms or spaces to be conditioned in order to provide thermal comfort condition. When the conditioned air cannot be supplied directly from the air conditioning equipment to the spaces to be conditioned, then the ducts are installed. The duct systems convey the conditioned air from air conditioning equipment to proper air distribution points or air supply outlets in the room and carry the return air from the room back to the air conditioning equipment for reconditioning and recirculation.

The conditioned air (cooled or heated) from the air Conditioning equipment must be properly distributed to rooms or spaces to be conditioned in order to provide comfort conditions. It may be noted that duct system for proper distribution of conditioned air cost nearly 20 to 30% of total cost of equipment required Duct material is usually made from galvanized iron sheet metal, Al sheet metal or black steel. But now a day, the use of non-metal ducts has increased. The resin bonded glass fibre ducts are used because they are quite strong and easy to manufacture according to desired shape and size. They are used in low velocity applications less than 600m/min and for static pressures below 5mm of water gauge.

It may be made in circular, rectangular or square shapes. From an economical point of view, the circular ducts are preferred because the circular shape can carry more air in less space. This means less duct material, less duct surface friction and less insulation is needed. For rectangular duct, Shape is determined considering minimum aspect ratio.

The pressure in duct is usually expressed in mm of water. Rise in pressure in fan is known as fan total pressure (FTP). FTP & supply air flow rate (in cmm) are used to select the fan. Here the Pressure is lost due to friction between the moving particles of fluid (i.e. air) and interior surface of duct. When the pressure loss occurs in a straight duct, it is usually termed as friction loss.

II. METHODOLOGY & MATERIAL DESCRIPTION

The schematic of air duct layout is shown in figure in which the supply air from the fan is distributed in two outlets which are located in two different zones. A-B is the duct running from the supply air fan to zone 1, A-B-C is the duct running from supply fan to conditioned zone 2. These are known as duct runs.

The purpose of the duct design is to select suitable dimensions of duct for each run and then to select a fan, which can provide the required supply airflow rate to each conditioned zone. The following methods are most commonly used in air flow ducting.

1. Velocity method
2. Equal Friction Method
3. Static Regain method

1. Velocity Method: The velocity method is one of the simplest type of designing the duct system for both supply and return air. The various steps involved in this method are:
i. Select suitable velocities in the main and branch duct.
ii. Find the diameters of main and branch duct from airflow rates and velocities for circular ducts. For

rectangular ducts, find the Cross-sectional area from flow rate and velocity, and then by fixing the aspect ratio, find the two sides of the rectangular duct.

iii. From the velocities and duct dimensions obtained in the previous step, find the frictional pressure drop for main and branch ducts using friction chart or equation.

iv. From the duct layout, dimensions and airflow rates, find the dynamic pressure losses for all the bends and fittings.

v. Select a fan that can provide sufficient FTP for the index run.

vi. Balancing dampers have to be installed in each run. The damper in the index run is left completely open, while the other dampers are throttled to reduce the flow rate to the required design value.
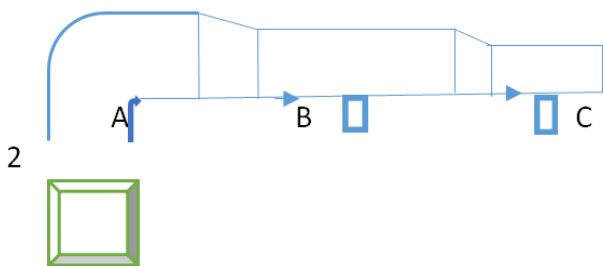
Figure 1. Air duct layout

1. Duct Material

The suitable duct material of our project are galvanize sheet material, aluminium sheet metal, black steel. Galvanised sheet metal is most commonly used because zinc coating prevents rusting and avoids cost of painting. GI duct thickness varies from 26 gauge (0.55mm) – 16gauge (1.6mm). Aluminium is used because of lighter weight and moisture resistance.

Figure 2. GI sheet

Black Sheet metal is always painted unless withstand high temperature. Resin bonded glass fibre ducts are used as they are quite strong and easy to manufacture. Cement asbestos duct may use for underground air distribution and wooden ducts are used where air has low motion contents.

Figure 3. different type of Air Duct

2. Air Cooler

Air cooler is an equipment used for air cooling. It is one type of heat exchange used to cool the air. A desert cooler is a device which cools air through the evaporation of water. It provides increase air flow and reduce temperature with the use of cooling fins, fans or finned coils that moves the heat out of room. It involves increase air flow over the target

area that needs to be cool.

Figure 4. Air cooler

3. Fan

The fan is an essential and one of the most important components of air cooling systems. The centrifugal fan is most commonly used in air cooling systems as it can efficiently move large quantities of air over a large range of pressures. The centrifugal fan with forward-curved blades is widely used in low-pressure air conditioning systems. The more efficient backward-curved and air foil type fans are used in large capacity high pressure systems.

The important operating parameters of a fan are:
1. Density of air (ρ) which depends on its temperature and pressure
2. Operating speed of the fan (ω in rps), and
3. Size of the fan.

III. DESIGN OF DUCT

1. Rules for Design of duct

Air should be conveyed as directly as possible to save space, power and material sudden changes in directions should be avoided. When not possible to avoid sudden changes, turning vanes should be used to reduce pressure loss. Diverging sections should be gradual. Angle of divergence $\leq 20^0$. Aspect ratio should be closest to 1.0. It should not exceed 4 air velocity should be within permissible limits to reduce noise and vibration.

2. Working Principal of Duct

The duct system is designed to supply the conditioned air in the room that is, cooled by the ducting equipment and to circulate the same volume of air. The duct system has two main air-transfer systems - supply and return. The supply side delivers the conditioned air to the home through individual room registers in which what you feel blowing out of the registers. The return side withdraws inside air and delivers it to the air handler of your central system. All of the air drawn into the return duct(s) is conditioned and should be delivered back through the supply registers.

The two factors are responsible for reducing the air flow in duct system .One is friction. As the air moves through a duct, it interacts with the surfaces. The smoother that inner surface is, the better it is for air flow. The rougher the surface, the more it slows down the air. The second factor is turbulence. This generally arises when you move air through fittings, or when you turn the air.

When air comes out of the air handler, it gets sent to the various rooms in the house. As it travels through a trunk-and-branch duct system, the quantity keeps diminishing because some of it gets diverted down each branch on the way to the end. Each section of duct, each fitting, each turn of the air adds resistance to that air flow because of friction and turbulence. Grilles and registers, filters, and balancing dampers also add resistance. That resistance results in decreases in the static pressure, or pressure drops. So, we begin at the blower with a

high pressure. Then the air comes out of the supply vents, which pressure has dropped to zero (relative to room pressure).

Fig. 3 Effect of elbow throat on turbulence within a duct system. The sharp throat of (A) creates more turbulence than the rounded throat of (B).

DUCT DESIGN CALCULATION

METHOD USED FOR SIZING OF DUCT: VELOCITY REDUCTION METHOD

$Q=2.14 m^3/sec$ (Let velocity $=6m/sec$)

For 1st outlet	For 2nd outlet
$Q=A \times V$	
$1.5=A \times 6$	$Q=A \times V$
$A= 0.25 m^2$	$0.64=A \times 6$
Equivalent diameter$=0.556m$	$A=0.106 m^2$ Equivalent diameter$= 0.35188m$
L=22" & B=18"	**L=16" & B=10"**

1. Heat load calculation

The purpose of heating and cooling load calculations then is to quantify the heating and cooling loads in the space to be conditioned. Rough estimates of load may be made during the concept of design phase.

The major components of load in buildings are due to the direct solar radiation through west glass transmission through fabric or structure and fresh air ventilation.

I. Heat Transfer through Building Structure:

The heat gain or losses to be considered in building is the heat transfer through walls, roofs, ceiling, floor, etc., the building structure. The load due to such heat transfer is often referred to as the fabric heat gain or loss. According to equivalent temperature differential method, the heat transfer is given by:

$Q=UA (T2-T1)$

$U=$over all heat transfer coefficient,

$A=$area of wall,

$(T2-T1)=$Equivalent temperature difference

II. Heat Gain by the Solar Radiation:

The glass has high transitivity so that considerable amount of heat is poured directly into the A/c space by sun through the glass. This amount varies from hour to hour, day to day, and latitude to latitude. The details of solar radiation with respect to time of day and situation of glass area given in the ASHRAE guides. Solar radiation is often the largest component of the room Sensible heat load for a building with considerable window area.

III. Solar Heat Gain through Glass:

Glass which is transparent allows the sunrays to pass through it. This results in heat dissipation inside the room. The amount of heat dissipated into room depend upon the glass area that is exposed to sun.

IV. Solar Heat Gain through Walls and Roofs:

Heat gain through the exterior construction (walls and roof) is normally calculated at the time of greatest heat flow. It is caused by the solar heat being absorbed at the exterior surface and by the temperature difference between the outdoor and indoor air. The heat flow through the structure may then be calculated, using the steady state heat flow

equation with equivalent temperature difference (ETD).

$Q = U*A*ETD$

Q = heat flow rate KJ/Sec

U = transmission rate

A = Area of surface (Sq. m)

ETD = Equivalent Temperature Difference (K)

V. Heat Gain through Light & Appliances:

Lights generate sensible heat by the conversion of the electrical power input into light and heat. The heat is dissipated by radiation to the surrounding surfaces, by conduction into the adjacent materials and by convection to the surrounding air. Electric appliances contribute latent heat, only by virtue of the function they perform that is, drying, cooking, etc., whereas gas burning appliances , contribute additional moisture as a product of combustion.

Room: CAD Lab area			0	City:	NAGPUR			
					DBT	WBT	RH	W(KJ/Kg of dry air)
			0	ODC	43	27	29	0.016
Est. For : BUILDING PLAN (DESIGN CONDITION)				IDC	25	18	50	0.01
				Diff	18			

NAGPUR ENVIRONMENT CONDITION (BY ISHRAE)
MAY 15

	SUMMER	WINTER	MONSOON
DBT	41.4	11.5	26.2
WBT	23.6	9.4	31.9

	L	B	H	Area (sq.ft)	Volume (ft.cb)	Occup.
Dimension	32	26	11	760	8360	45

SENSIBLE HEAT					
LOAD	ITEM	AREA	TEMP. DIFF	FACTOR	WATTS
SOLAR GLASS GAIN	NORTH	7.0311	44	5.9	1825.27
SOLAR TRANSMISSION GAIN-WALL AND ROOF	NORTH WEST	32.20	10.6	2.8	955.7
	ROOF	76.0875	29.7	3.07	6937.58
TRANSMISSION GAIN	DOOR	2.4747	18	0.63	28.063
	ALL GLASS FLOOR	8.9531	18	5.9	950.819
		69.8375	2.5	6.05	1056.3
INTERNAL HEAT GAIN	PEOPLE	40	-	75	3000
	LIGHTS	3	40	1.25	150
	FANS	4	100	0.8	320
	COMPUTERS	32	150	0.8	3840

TOTAL ROOM SENSIBLE HEAT	19063.73
EFFECTIVE TOTAL ROOM SENSIBLE HEAT	19063.73

LATENT HEAT				
ITEM	NOS	TEMP. DIFFERENCE	FACTOR	WATTS
PEOPLE	40	-	55	2200
APPLIANCES	32	150	0.07	336
SAFETY FACTOR		5%		126.8

TOTAL LATENT HEAT	2662.8
EFFECTIVE ROOM LATENT HEAT	2795
EFFECTIVE ROOM TOTAL HEAT	21859.66
GRAND TOTAL HEAT	21859.66
TONNS OF REFRIGERATION	6.25

CALCULATION OF MASS FLOW RATE			
Qtotal=m*Cp(T2-T1) 21859.66= m*1005x18 m*= 1.20kg/sec	Density =mass/volume Density=1.13@40°C volume=1.20/1.13 volume=1.07 m^3/sec	CFM=cubic feet per min Volume=1.07x(3.22)3x60 Volume=2265.46CFM	Consider factor of safety 2 Volume=2265.46x2 =4350.92 Volume=7704m^3/hr. Volume=2.14m^3/sec

DUCT DESIGN CALCULATION	
METHOD USED FOR SIZING OF DUCT: VELOCITY REDUCTION METHOD Q=2.14m^3/sec (Let velocity =6m^3/sec)	
For 1st outlet Q=AxV 1.5=Ax6 A= 0.25 m^2 Equivalent diameter=0.55607m **L=22" & B=18"**	**For 2nd outlet** Q=AxV 0.64=Ax6 A=0.106m^2 Equivalent diameter=0.351886m **L=16" & B=10"**

IV. CONCLUSION

For designing the duct, building heating load, and air flow rate is calculated and duct design for building is done by velocity reduction method. This project work has given us opportunity for enrichment of our knowledge in area of R&AC and exposure to the practical field to learn the latest trends in this field and built our confidence to develop ourselves as an engineer.

It is used for testing, designing of air duct cooling system for office/residential building/auditorium with the help of load calculation.

V. ACKNOWLEDGEMENT

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"Role of Universal Human Rights to Wards Peace Building"

Nawaz khan, Sajid Quazi, Dr. Nuzhat Rizvi
Associate Professor, Department of Humanities, Anjuman College of Engineering and Technology, Nagpur,
Maharashtra, India

ABSTRACT

The present paper aims at role of universal human right towards peace building. As the twentieth century witnessed some of the worst war atrocities committed in the history of humanity. Today a key feature of the majority of conflicts that we witness today is their sub-national nature that is the subsidiary political, social and cultural polities that exist and function within the nation-state. We need to work more towards the notion of positive peace which means a peace that promotes reconciliation and co-existence on the basis of human rights and social, economic and political justice. This is achieved through an assessment of the elements needed to build a nation, and the ways in which specific human rights can contribute to a process of nation-building. The conclusion reached is that it is important for all sectors of society – and, in particular, minority groups – to be able to feel a connection to the newly rebuilt nation. In the absence of such a sense of belonging, it is inevitable that civil unrest will return. Whilst the introduction of human rights can cause controversy, the paper demonstrates that such does not always have to be the case: human rights can be introduced in a culturally-specific manner, thereby averting the common concern that human rights are simply a means of the West imposing its views on the rest of the world.

Keywords: conflicts, society, human rights, nation building, reconciliation

I. INTRODUCTION

Building peace is a major challenge not only for developing countries but even for poor countries as well as small organization and group. Looking around to the world of conflict it is the basic assumption to those who practice peacemaking are capable of doing better at conflict, as well as with awareness and communication. It is the same concept that holds true to great civilizations, cultures and historical religions it is the fact that individuals evolve endlessly whether for the best or the worst until the day that they die the same hold true for civilizations. In our search for some semblance of order in the chaos and nebulae of conflicts, we often see that for one overriding casual factor, in order to find a way to solve the conflicts or heal damage done by it. But this skews the complex casual interactions of conflicts.

The twentieth century witnessed some of the worst war atrocities committed in the history of humanity. This included the genocide in America, the Holocaust and the wanton carnage of the Second World War. The cold war retained this pattern of destruction with proxy wars being fought

along the East/West or Soviet/US ideological divide. In the aftermath of the Cold war the hope for a more stable and just international order was rapidly dissolved by the internecine conflicts that plagued all continents. These conflicts took on a pernicious form in the sense that they undermined the very fabric of the nation-state. Today a key feature of the majority of conflicts that we witness today is their sub-national nature that is the subsidiary political, social and cultural polities that exist and function within the nation-state. Sub-national conflicts have proved to be highly resistant to the intervention of inter-governmental organizations like the United Nations (UN) and regional organizations. In effect the international system has endeavoured to resolve such conflicts with limited success. The world continues to be plagued by sub-national conflicts in places such as the Darfur region of the Sudan, the Kashmir region of India and Pakistan, Lebanon, Nepal, Sri Lanka, Tajikistan, Uganda and Western Sahara. Effort to build peace has come under increasing scrutiny.

II. PEACE BUILDING CONCEPT FROM NEGATIVE TO POSITIVE

In 1992, the Agenda for Peace, published by the then United nations Secretary- General Boutros Boutros Ghali, defined peace building as the medium to long term process of rebuilding war affected communities. It defined 'peace building as action to identify and support structures which will tend to strengthen and solidify peace to avoid a relapse to conflict'. Over time the definition of peace building has gradually expanded to refer 'to integrated approaches to address violent conflict at different phases of the conflict cycle'. Building peace requires the promotion of social and economic justice as well as the establishment or reform of political structures of governance and the

rule of law. These activities are ultimately striving to bring about the healing of a war affected community through reconciliation. Reconciliation however is not sustainable without socio-economic reconstruction and development, neither of which can be done without mobilization of resources. Peace building is effectively a political activity but one that seeks to unify the social and economic spheres (Murithi, 2009:3).

In the seventeenth century, the philosopher Spinoza claimed that peace is not the mere absence of war, but a virtue that comes from the vigor of one's soul and mind (Raviv, Oppenheimer, Bar-Tal, 1999:91). After three centuries, however the heroes of peace, who many times are assassinated by their own followers (for example, Mohandas Gandhi and Yitzhak Rabin), "Look pale beside the heroes of war" (Gillet, 1994:21).Peace building is an ethical process that requires a close partnership, respect and dialogue among all the actors. In a very real sense, then, there is a need to emphasis the fact that peace building can ultimately only succeed if it is conducted on the basis of an ethical framework. The notion of peace therefore also needs to be unpacked. When we refer to peace we need to consider that there are two broadly defined ways to understand the nature of peace. For most commentators there is a distinction between condition of negative peace and a condition of positive peace. Negative peace is the condition that most people refer to when they are discussing issues to do with peace and conflict: it is the condition in which peace is based on the absence of violence. We need to work more towards the notion of positive peace which means a peace that promotes reconciliation and co-existence on the basis of human rights and social, economic and political justice. In this context when we talk about peace building we are referring to the process whereby

the goal is to strengthen the capacity of societies to promote positive peace. Within most of the peace building and development, actors and agencies there increasingly a focus on the importance of promoting positive peace. Among these agencies in the last decade we have witnessed a resurgence of the role of civil society in actively advocating for, pursuing and implementing peace building strategies.

III. RELIGION, VIOLENCE AND HUMAN CONFLICTS

Religious meaning systems evolve out of particular cultural constructs and worldviews. They are accompanied by patterns of interpersonal moral and political actions that emanate directly from these worldviews. These systems of meaning are constantly evolving, despite the fact that conservative religious traditions like or need to present themselves to constituencies (who are starving for some form of permanent meaning in the modern world) as a changeless and ancient bed rock of certainty. It is the evolving character of these mythic universes that embodies both the promise and the peril of organized religion to influence the direction of political entities on the globe. Religious traditions promise to heal the wounds of human existence by uniting human beings to ultimate reality, yet the history of religions is steeped in blood, war, and sacrifice and scapegoating. While many interpreters of religion have focused on the constructive role of religion in human life, the brutal facts of the history of religions impose the stark realization of the intertwining of religion and violence: violence, clothed in religious garb, has repeatedly cast a spell over religion and culture, luring countless (decent) people-from unlettered peasants to learned priests,

preachers and professors-into its destructive dance (Boersema, 2006:11).

With the reinstatement of democracy, religions stopped favoring institutional action at the level of government or NGOs and undertook a kind of 'grassroots' approach working with men and women on the street (although this should be understood more as a relative than an absolute difference). This change of strategy has been clearly related to political transformations (Ter Haar, 2005:81). Traditional international relations practice more of an emphasis on the notion of negative peace as the absence of violence. Increasingly, peace building literature is making the case for mainstreaming the notion of positive peace. The tacit assumption that this adopts that there needs to be a transition towards adopting the notion of positive peace, in order to ensure that there is an ethical commitment towards promoting and consolidating genuine peace building.

IV. APPROACHES TO PEACE BUILDING ON THE GROUND AHIMSA (NON-VIOLENCE)

The most basic approach to consolidate peace building is the basic law of our being according to Gandhi. That is why it is used as the most effective principle for social action, since it is in deep accord with the truth of man's nature and corresponds to his innate desire for peace, justice, order, freedom and personal dignity. Since violence degrades and corrupts man, to meet force with force and hatred with hatred only increases man's progressive degeneration. Non-violence on the contrary heals and restores man's nature while giving him a means to restore social order and justice. Ahimsa is not a policy for the seizure of power. It is a way of transforming relationships so as to bring about a peace full transfer of power, affected freely and without compulsion by all concerned, because all

have come to recognize it as right. Since ahimsa is in man's nature itself, it can be learned by all, though Gandhi is careful to state that he does not except everyone to practice it perfectly. However, all men should be willing to engage in the risk and wager of ahimsa because violent policies have not only proved bankrupt but threaten man with extinction (Merton, 1965:23). True non-violence not only implies the highest form of bravery: it is a kind of charismatic gift, a "creed" and a "passion" for which one sacrifices everything: it is a complete way of life in which the satyagrahi is totally dedicated to the transformation of his own life, The non-violence of the weak is rather a policy of passive protest, or even a cloak for impotent hatred which does not dare to use force. It is without love. It seeks to harm the adversary in ways that do not involve force, and it may resort to secret sabotage or even terrorism. Such conduct is not worthy of the name of non-violence. It is demoralizing and destructive. To this false and cowardly nonviolence Gandhi says he would prefer an honest resort to force. Hence those who cannot practice a really dedicated non-violence should defend their rights and justice by force, if no other means are available. Gandhi does not preach the passive surrender of rights or of human dignity. On the contrary, he believes that non-violence is the noblest as well as the most effective way of defending one's rights.

V. INCULCATING THE VIRTUE OF FORGIVENESS

Forgiveness is more than a synonym for pardon, which several theological teachings advocate. Ethically speaking, forgiveness can more appropriately be thought of as sacrifice, it is the giving up of one's self for the sake of others. In this sense forgiveness is in effect an ethical virtue. It assesses the notion of forgiveness prior to assessing

some illustrations of forgiveness. A major challenge that confronts the consolidation of peace building in war affected countries is putting in place effective and sustainable process of forgiveness and reconciliation. Forgiveness is a major component of the reconciliation process. However, victims, perpetrators and observers a like consider achieving forgiveness to be a very difficult and sometimes impossible process in the context of situations where grave human rights atrocities are committed. The processes and mechanisms of peace building need to be informed by the issue of how to enable victims, in what are increasingly violent sub-national conflicts, to move from a condition in which they morally exclude their perpetrators as valid interlocutors to a situation in which they morally include and acknowledge the claims of the 'others'(Murithi,2009:113).

We as democratic, liberal societies base our legal/political systems on a set of rights and obligations that allows individuals to do what they want as long as they do not violate the rights of others, yet modern nation-states also require their members to undergo certain rites of passage in order to induct them into the national community. This includes learning the common language, adopting the social norms, and internalizing the historical symbols and beliefs that define nationality. In modern nation-states, one major institution developed to carry out the socialization process, especially of youth, is the school. For many years in the United States and still today in Israel, compulsory military service has played a major role in socializing young people into a national culture (Iram, 2003:29).

VI. THE VALUE OF RECONCILIATION

If and when the process of forgiveness is successfully undertaken then the parties involve d

are ready for genuine healing and reconciliation to begin. Effective reconciliation ultimately consolidates peace building. However, as with forgiveness, reconciliation is a process, not an event, and to achieve effective reconciliation may require one, two or more generations. Genuine peace is not sustainable without social, economic and political justice. The Owenities focused on the broadest malady namely human emancipation via a transformed education, which would promote the creation of a new moral world. They believed that to bring such world into existence at least three dramatic changes would be necessary: a definitive solution to the problem of poverty, a thorough going reform of working practices, and the establishment of communities organized socially and economically on a cooperative model (Boersema,2006:131). Both war and peace are uniquely human inventions. Both have evolved a pace with the development of culture in general, as human ingenuity has devised its usual stunning variety of forms for them. Most people recognize the ways in which war making has evolved technologically, and lament that 'progress' (Fogarty, 2000:11). War and peace are not simple opposites, where peace is defined as the absence of war. Rather, both war and peace are processes of interaction, conflicts, and cooperation, involving the pursuit of collective and individual interests and rooted in a connection between the individual and the community. Both war and peace are collective endeavors made possible by the human desire to form and maintain community. Many of the peace building 'international civil service' are thoroughly committed to the idea of 'peace' as both desirable and theoretically and practically possible. They are also careful to avoid the creation of external dependency; they endeavour to be sensitive to the needs of local ownership and to local conditions, and are very careful not to upset sensitive local political and social customs or arrangements where these are deemed to be viable within the liberal peace (Richmond, Franks, 2009:4).

VII. CONCLUSION

Poverty around the world remains the dominant feature along with security as a major concern. Violence and war are also intricate pattern of conflict. Peace building is adopted by governments on national level, nongovernmental organization, regional and international intergovernmental institution as means by which the outside world can contribute to the resolution of societal conflict and to the reconstruction or construction of a culture of peace in post conflict situations.

The areas of action are recommended to implement effective peace building in humans are listed below:
1. Culture of peace through education is the very concept of power which needs to be transformed— from the logic of force and fear to the force of reason and love.
2. Sustainable economic and social development represents a major change in the concept of economic growth which, in the past, could be considered as benefiting from military supremacy and structural violence and achieved at the expense of the vanquished and the weak.
3. Respect for all human rights and the elaboration and international acceptance of universal human rights. calls for a transformation of values, attitudes and behaviours from those which would benefit exclusively the clan, the tribe or the nation towards those which benefit the entire human family.
4. Equality between women and men is only [the] linkage of equality, development and peace can replace the historical inequality between men and women that has always characterized the culture of war and violence.

5. Democratic participation among the masses is the only way to replace the authoritarian structures of power which were created by and which have, in the past, sustained the culture of war and violence."

6. Understanding, tolerance and solidarity has never been a war without an "enemy", and to abolish war, we must transcend and supersede enemy images with understanding, tolerance and solidarity among all peoples and cultures.

7. Participatory communication and the free flow of information and knowledge are needed to replace the secrecy and manipulation of information which characterize the culture of war.

8. International peace and security inculcate peace diplomacy, peacekeeping, disarmament and military conversion.

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Use of Artificial Intelligence in Education

Abhishikt Kadam, Abdul Rafey

Computer Science, Anjuman College of Engineering and Technology, Nagpur, India

ABSTRACT

To create an online Artificial Intelligence website that can predict the way in which a student or a user learns. A system which will adapt itself according to that person to teach him/her a particular topic. Parameters can be extracted from a set of videos tutorials and tests which can help to understand the capabilities and potential of a student. The student will have to go through a set of video tutorials after which he/she will have to appear for the test and based on the parameters and outcomes the potential, capabilities, grasping power, the weak and the strong areas will be identified.

Keywords: Artificial Intelligence, Education, Video Tutorial.

I. INTRODUCTION

From junior K.G to a graduate school, one of the key ways AI will impact education is through the application of higher levels of personalized learning. Some of this is already happening through the increasing numbers of adaptive learning programs, simulations and software. These systems counter to the needs of the student, highlighting certain topics, repeating things that students haven't mastered, and generally helping students to work at their own speed.

This kind of personalized education could be a software aided solution to helping students at different levels work together in one classroom, with teachers facilitating the learning process and offering help and support when needed. Adaptive learning has already had a huge impact on education across the globe, and as AI advances in the coming decades adaptive programs like these will likely only improve and expand.

AI or artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. These processes include learning (the acquisition of information and rules for using the information), reasoning (using the rules to reach approximate or definite conclusions), and self-correction. Particular applications of AI include expert systems, speech recognition and machine vision. Similar will be the AI EDUTECH website that can predict the way in which a student or a person learns.

II. RESEARCH AND PAPER

As YouTube contains tutorials on every known subject or topic in the world it can act as a huge video library from which a student can choose the subject he wants to learn. Initially the student will apply for a course and the relevant videos will be

shown. Based on the video watched some parameters will be extracted from the video for e.g. the number of pause,

subtitles, part of a video repeated again and again, etc. The user will then have to solve some questions based on the topic taught in the video. The time in which the student answers the multiple choice questions also acts as a parameter as a bright student will answer most of the questions right within a short period of time and on the other hand an average student might require more time and not all answers may be true. The software will then evaluate the result and predict the areas in which the student is weak or strong. System will also predict the information in theoretical as well as graphical information.

III. STUDIES AND FINDINGS

- ✓ AI will help revolutionize the way in which students learn, and how they acquire basic skills.
- ✓ It can make trial and error less scary.
- ✓ It can change the role of teachers.
- ✓ It can also be used to give helpful feedback.
- ✓ It can automate grading system.
- ✓ It can help predict the unique learning pattern of individuals. It can help to identify the weak and the strong areas of a student or a user.

IV. FUTURE SCOPE

This website will prove to be very useful in many ways such as students can easily and efficiently measure the various parameters about his study such as how much time it takes for him to complete a topic or what are his or strong and weak points. The another advantage is the consistency that e-

learning provides. AI-Edutech is self-paced, and learning is done at the learner's pace. The content can be or her repeated until it is understood by the trainee. It can be made compelling and interesting with multimedia, and the trainee can be given multiple learning paths depending on his or her needs.

V. CONCLUSION

The technique which will be developed on the above idea will be able to provide a completely new method of learning. It will help restructure the study and learning pattern completely based on video lectures and tests. It will help lighten the burden of the teachers as this website will help the students learn in an attractive and stress-free manner involving more and more use of technology. It will change the concept of learning and reshape the education structure.

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Design of Hydraulically Operated Main Stand

Aatif Badar[1], Altamash Ali[1], Ayesha Sheikh[1], Yaminee Tembhekar[1], Prof. Namrata Lotia[2]
[1]Mechanical Engineering, RTMNU, Nagpur, Maharashtra, India
[2]Department of Mechanical Engineering, ACET, Nagpur, Maharashtra., India

ABSTRACT

The conventional main stand which we use in our two wheeler is very problematic, especially for weak people and the drawback of side deployed stand are also unavoidable. Generally, the vehicle needs to be lifted on the center stand for following reasons At winter season the fuel needs more heat to acquire its ignition temperature, and battery is not capable of providing proper cranking, thus it needs to be lifted for the kick start. When there is shortage of parking space the vehicle needs to be lifted on main stand, and at the time of maintenance and washing, it again needs to lifted. While performing this task one can get severe back pain on sprain in leg or can face long term back pain.(as observed). Considering the problem in above mentioned areas we are opting for semi automation, and our project's main aim is to reduce man power through Hydraulically Operated Main Stand and Hydraulic fluid plays main role in our project.

Keywords: semi automation, reduced man power, kick start, fuel ignition temperature, hydraulically operated main stand.

I. INTRODUCTION

Normally, we have seen in our surrounding, conventional method of applying main stand requires lots of human effort which is a tough & hard task for a group of people who have less strength and physically weak like older aged people and females of all age groups.To eliminate this problem we are introducing this concept. It is hydraulically operated main stand, and it will work on fundamental principle of hydraulic that is Pascal's law.

The operation is mainly controlled by a switch which will help to mount the vehicle on the main stand. Through 12V battery the pump will get power and then through pump the hydraulic cylinder will be operated and as a result the stand will be able to lift the vehicle and mount on it with a proper ground clearance. The side stand generally on observation basis leads to more accidents and when the weight of the vehicle is continuously given on the side stand then fatigue occurs in the stand and effects the life of side stand. And normally its seen that people can easily drive 2 wheelers but when it comes to mounting it on the main stand then one always requires others help to mount it on the main stand. Also, it is always instructed by the manufacturer that put the vehicle on the main stand as much as possible.

Currently it is not possible to change the position of the stand , usually it is deployed under the engine where the ground clearance is minimum.

Project description:

We are introducing our project so as to reduce the human efforts, and for this we are using hydraulic system for optimum result. The hydraulic system basically consists of gear pump (positive displacement pump), hydraulic fluid, oil reservoir, hydraulic cylinders and strainer, control valves.

Figure 1

The above diagram is the brief explanation of the hydraulic circuit.

Similarly on the basis of hydraulic circuit we have designed our main stand, here we are using the switch which will be operated by the 12V battery and the battery will supply the current to the pump the pump will operate the hydraulic cylinder and when the cylinder will be operated then the inclined stand will be come down and then opposite moment will act w.r.t. the point where the stand is touched in ground and then the vehicle will be lifted up.

The whole idea is based on Pascal's law and it states that the pressure exerted anywhere in a confined incompressible fluid is transmitted equally in all direction throughout the fluid such that the

pressure ratio remains the same. A change in pressure at any point in an enclosed fluid at rest is transmitted undiminished to all points in the fluid.
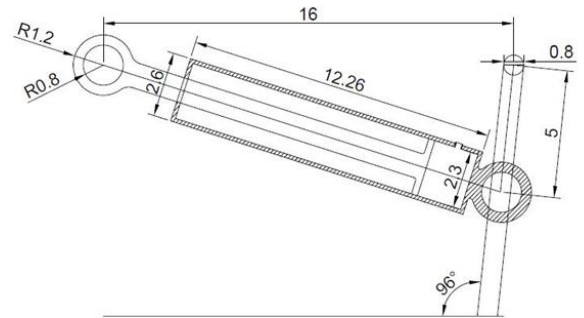
Figure 2. Design of cylinder

Hydraulic cylinder:

Hydraulic cylinder get their power from pressurized hydraulic fluid, which is typically oil. The hydraulic cylinder consists of a cylinder barrel in which a piston connected to a piston rod moves back and forth, the barrel is closed on one end by the cylinder bottom and the other end by the cylinder head where the piston rod comes out of the cylinder .

The hydraulic cylinder is the actuator or motor side of the system. The generator side of the system is pump which delivers a fixed or regulated flow of oil to the hydraulic cylinder to move the piston.
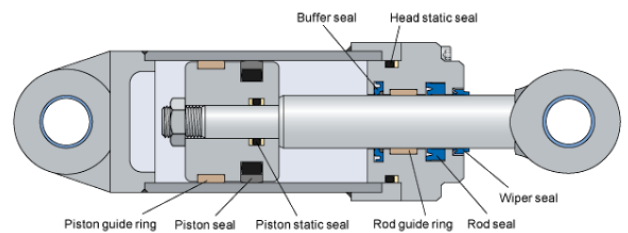
Figure 3

Gear pump:

A gear pump uses the meshing of gear to pump fluid by displacement. It used to deliver constant pressure fluid at the discharge point. Once fluid is

discharged it is not possible for the fluid to return back in the pump.
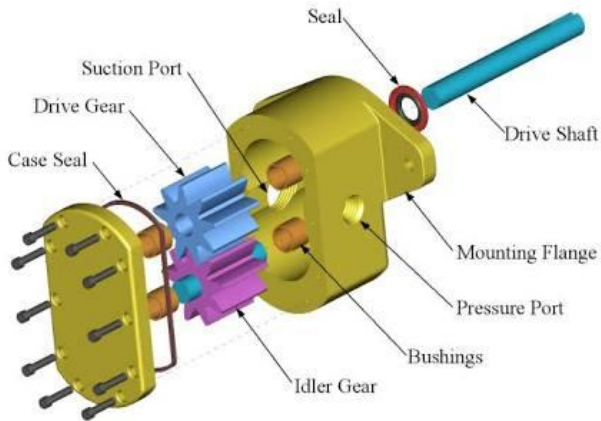
Figure 4

Hydraulic fluid and its properties:

Hydraulic fluid is used to transfer the power in the desired component the system will work more efficiently if the fluid used has zero compressibility. The oil used in the system also provides cushioning effect for the shock load so as to increase the life of the components.
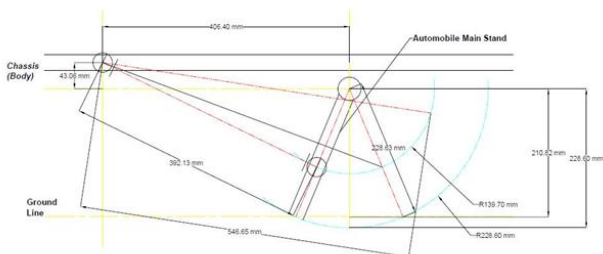
Figure 5. line diagram of the main stand

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"Comparative Analysis of Multi-Storey Building with Base Isolation Under Seismic Loading."

Bhavesh Ninawe[1], Ahmad Raza[1], Amol Gajbhiye[1], Mohd. Atif[2]
[1]Civil Engineering, ACET, RTMNU Nagpur, Maharashtra, India
[2]Astt Prof. Civil Engineering, ACET, RTMNU, Nagpur, Maharashtra, India

ABSTRACT

The main objective of this work is to compare different base-isolation methods i.e Rubber base isolation in order to evaluate their effects on the structural response and to compare the effect of earthquake forces. An analysis is carried out by the ETABS Software on G+9 storey building with and without base isolation method. The building is designed as per provisions in IS 456:2000 and IS 1893: 2002 which is an Indian standard code for Earthquake design. A bare frame model and a model with Rubber base isolator was prepared and analysis was carried out in the ETABS software and the results such as Bending moment, Shear force, Torsion, Base shear & various Storey forces were evaluated by the system. These results are then analyzed and are compared in graphical as well as in tabular form.

I. INTRODUCTION

This paper gives a comparative result of seismic analysis of a multi-storey building models with and without base isolation. The properties of base isolated structures are highlighted. The aim of base isolation technique is to retard the earthquake forces which is coming through the base of the building and increase the strength and ductility of structure. Earthquakes are considered as one of the most dangerous natural hazard. From the old times it causes loss of human lives as well as property. From many researches it is found that base isolation is an optimum solution for seismic problems. The base isolation technique is considered as the most suitable method because it stops the effect of earthquake attack. The flexible base helps to de couple a superstructure from its substructure built on a seismic ground and results in protecting the structure against collapse due to lateral forces. This paper gives the comparison of models based on the effect of axial forces, moment, deflection and base shear in tabular and graphical forms.

II. BASE ISOLATION SYSTEM

Lead Rubber isolation

Lead Rubber Bearing (LRB) is a type of base isolation employing a heavy damping. It was invented by William Robinson. It is mainly used in heavy damping structures in vibration control technologies and particularly in base isolation techniques. It is used as a valuable source of controlling vibrations thus enhancing a building's seismic performance.

The rubber in an isolator which acts as a spring. It is laterally very soft but vertically very stiff. These two characteristics allow the isolator to move laterally with relatively low stiffness yet carry significant axial load due to their high vertical stiffness.

Figure 2. Plan of building

Figure 1

III. METHODOLOGY

Modelling and Analysis

This chapter deals with the mathematical modeling of building with different base isolating units. In order to compare the seismic response various models has been prepared using STAAD-PRO V8i. For each case, seismic analysis has been discussed. Complete analysis is carried out for dead load, live load & seismic load. All combinations are considered as per IS 1893:2002.

Figure 3. Rendered view

Description of the building

- The typical framing plan of G+9 storey building is shown in figure the building is rectangular in plan.
- Size of the building is taken as 15mX9m
- Each storey height is considered as 3m.
- Total Height of the building is 30m.
- Spacing of frame along length and width is 3m.
- Materials grade of M20 & Fe415 were used for the design.

Figure 4. Elevation

Description of different Models

Model No.1 shows the model of regular building i.e. frame type.

Model No.2 shows the model of regular building with Rubber Base isolation provision.

Selection of factors

1) Zone II, Zone factor (Z) = 0.1 (As per IS 1893 (PART I):2002, Table 2)
2) I= Importance factor =1
3) (As per IS 1893 (PART I): 2002,
4) Table 6)
5) R= Response reduction factor
6) (for SMRF) = 5
7) (As per IS 1893 (PART I): 2002.
8) Table 7)

Table 1. Description of various elements

Discription	Numeric value
Total depth of slab	150 mm
Floor finish load	1KN/m²
External wall thickness	230 mm
Internal wall thickness	230 mm
Size of external column	230 mm X 600 mm
Size of internal column	230 mm X 600 mm
Size of beam in longitudinal and transverse direction	230 mm X 400 mm
Live load	3KN/m²

IV. ANALYSIS AND RESULTS

- ### Comparison of Shear force
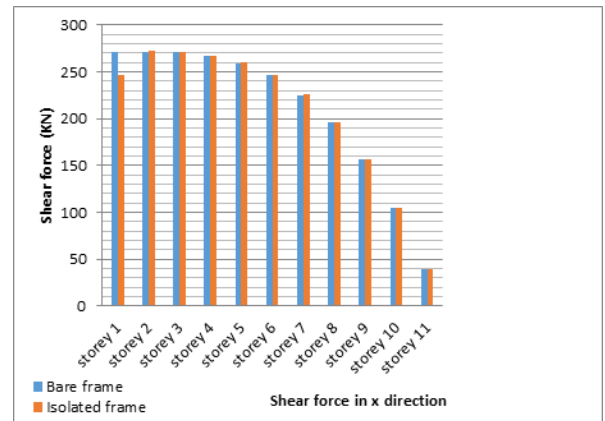
Figure 5. Shear force in X direction

Table 2. Comparison of Shear force in X Direction at base

Vx (Fix base)	Vx (Base isolated)
222.19 KN	198.37 KN
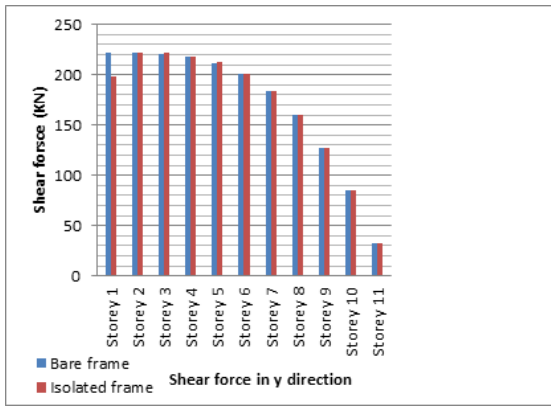
Figure 6. Shear force in Y direction

Table 3. Comparison of Shear force in Y Direction at base

V_Y (Fix base)	V_Y (Base isolation)
271.70 KN	245.94 KN

A comparison of Shear force in X & Y direction is shown in the figure where you can see that the isolated frame has a less shear force while that of fixed base structure which has more shear force acting on the base of the structure.

If the shear at base is more then the lateral displacement of the structure will be more so to overcome the lateral displacements and to minimize the effect the rubber base isolating material is bolted between foundation and plinth level, so that all the lateral forces are taken by the Rubber and the superstructure is safe against the earthquake forces.

- **Comparison of Bending moment**
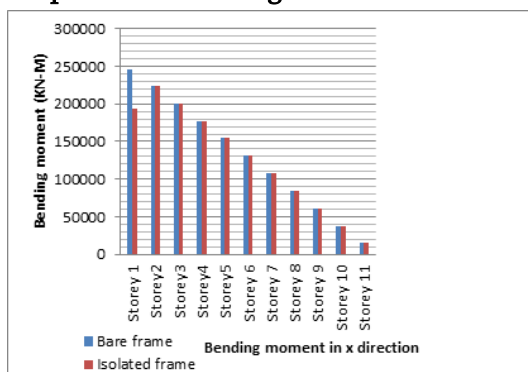
Figure 7. Bending moment in X – direction

Table 4. Comparison of Bending moment in X direction at base

M_X (Fix base)	M_X (Base isolated)
245992.28 KN-m	194274.01 KN-m
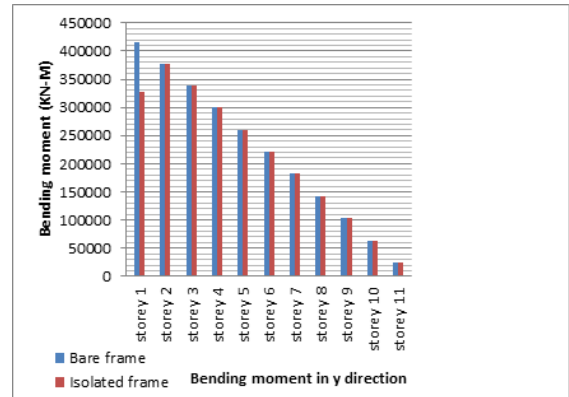
Figure 8. Bending moment in Y – direction

Table 5. Comparison of Bending moment in Y direction at base

M_Y (Fix base)	M_Y (Base isolated)
415266.00 KN-m	327958.00 KN-m

A comparison of bending moment in X & Y direction is shown in the figure where you can see that the isolated frame has a less bending moment while that of fixed base structure.

By the application of rubber base isolator in the structure the bending moment at the base is much reduced if we compare it with a fixed base structure.

- **Comparison of forces in plinth nodes**
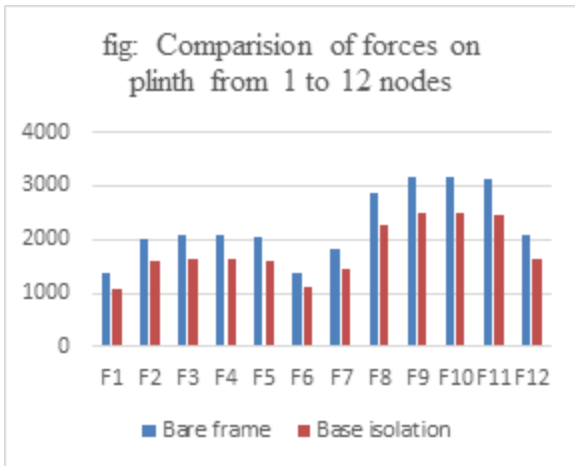
Figure 9. Graphical representation of Plinth level forces
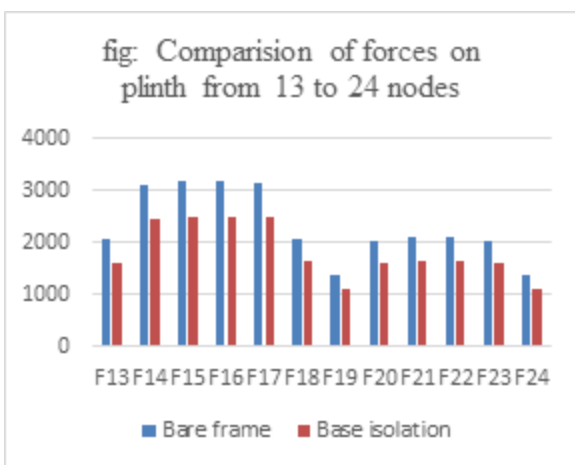
Figure 10. Graphical representation of Plinth level forces

IV. CONCLUSIONS

✓ Percentage reduction of shear force is found to be 10.70% by using base isolation.
✓ Percentage reduction of Bending moment is found to be 21.02% by using base isolation.

It is found that the base isolation technique is very effective in the control of earthquake forces. Also this technique reduces shear as well as bending moment in the base storey which is our desired result. If the forces at the base is controlled, then it is possible that the building is safe against collapse because the earthquake forces are transferred on the foundation through the soil, and then these forces are transferred on the superstructure through the foundation.

So, if the plinth level (base) of the building is safe against the collapse then the whole superstructure can be safe against the collapse, and plinth can only be safe if the forces coming through the earthquake can be reduced from its original magnitude.

So, the Base Isolation technique proves to be much efficient in the reduction of all kind of forces and also it protects the building from the collapse.

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Design and Switching of Single Phase Five Level Cascaded H-Bridge Multilevel Inverter Using SPWM Technique

Shubham Gajbhiye[1], Esha Vyas[2], Trupti Kapse[2], Prof. Abhijit Dutta[3]

[1]Student BE 8th Sem Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur, Maharashtra, India

[2]Student Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur, Maharashtra, India

[3]Assistant Professor Dr. Babasaheb Ambedkar College of Engineering and Research, Nagpur, Maharashtra, India

ABSTRACT

The utilization of multilevel inverter in medium and high power applications is increasing for improving the power quality. The multilevel inverter was introduced as a solution to increase the converter operating voltage above the voltage limits of classical semiconductors. The function of the multilevel inverter is to synthesize a desired high voltage from several levels of dc voltages. The multilevel inverters are becoming popular as they have low harmonic contents, better electromagnetic compatibility and lower switching losses. This paper deals with a single phase five level cascaded H-bridge multilevel inverter with R-load. Sinusoidal Pulse Width Modulation technique is used to develop the switching pattern for the five level H-bridge multilevel inverter to reduce the total harmonic distortion at the output. A Pi filter is used to further reduce the total harmonic distortion and improve the power quality. This paper also compares the percentage THD of multilevel inverter with and without filter. It has been shown that the total harmonic distortion in multilevel inverter with filter is less than that in multilevel inverter without filter.

Keywords: Multilevel inverter (MLI), cascaded H-bridge (CHB), total harmonic distortion, sinusoidal pulse width modulation, Common mode voltage (CM)

I. INTRODUCTION

Power electronics circuits play vital role in production of electricity using renewable energy sources. It is mainly used to convert and control the signal. It converts the sources, either from DC/AC to AC/DC. To avoid the entire harmonic content filters are used.

Multilevel inverters are applied in the area of medium voltage and high power applications. It produces a desired MLI output voltage from the separate DC sources. The number of output voltage levels 'n' is determined by the number of separate dc sources 's' using the formula n=2s+1. When s=2, then the level of the inverter is n=5[1].

Demand for high-voltage, high power converters capable of producing high-voltage quality waveforms while utilizing low voltage devices and reduced switching frequencies has led to the multilevel inverter development with regard to

semiconductor power switch voltage limits. Multilevel inverters include an array of power semiconductors and capacitor voltage sources, the output of which generate voltages with stepped waveforms. The commutation of the switches permits the addition of capacitor voltages, which reach high voltage at the output, while the power semiconductors must withstand only reduced voltages [2].

The concept of multilevel converters was introduced in 1975. The term multilevel began with the three level converters. Multilevel inverter is based on the fact that sine wave can be approximated to a stepped waveform having large number of steps. The steps are supplied from different DC levels supported by series connected batteries or capacitors.

Advantages of multilevel inveter

Compared with the traditional two-level voltage converter the primary advantage of multilevel converters is their smaller output voltage step, which results in high power quality, lower harmonic components, better electromagnetic compatibility, and lower switching losses. Multilevel inverters make small Common mode voltage; consequently the stress in the bearings of a motor allied to a multilevel motor drive can be condensed. In addition CM voltages can be eliminated by using advanced modulation technique. Multilevel inverters can draw input current with low distortion [3].

Topologies of multilevel inverter

Topologies for multilevel inverter have been classified as shown in figure 1.
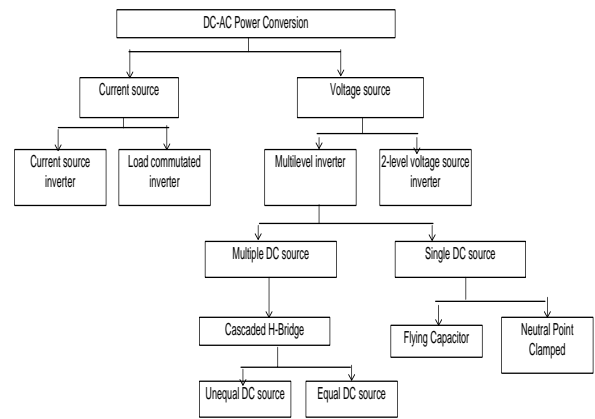
Figure 1. Classification of inverter topologies

Comparison of multilevel inverter topologies

Table 1 shows the comparison between the various topologies of multilevel inverter

Table 1. Comparative study between various classical topolofies of multilevel inverter.

Characteristics	Cascaded H-Bridge	Diode-Clamped	Flying capacitor
Main switching device	2(m-1)	2(m-1)	2(m-1)
Main diodes	2(m-1)	2(m-1)	2(m-1)
Clamping diodes	0	(m-1)(m-2)	0
DC Bus Capacitor	(m-1)/2	(m-1)	(m-1)
Balancing capacitor	0	0	(m-1)(m-2)/2
Redundancy	Redundant	Not redundant	Redundant
DC Bus sharing	Separate DC source	DC Bus sharing	DC Bus sharing
Structure	Modular	Not modular	Not modular
Flexibility	Flexible	Not flexible	Not flexible

Cascaded H-Bridge Multilevel Inverter

The number of output voltage levels 'n' is determined by the number of separate DC sources 's' using the formula n=2s+1. When s=2, then the level of the inverter is n=5 [1].

The separate DC voltages are V1 and V2 given to the MLI, it operates with eight switches Q1, Q2, Q3, Q4, Q5, Q6, Q7 and Q8 as shown in figure 2.
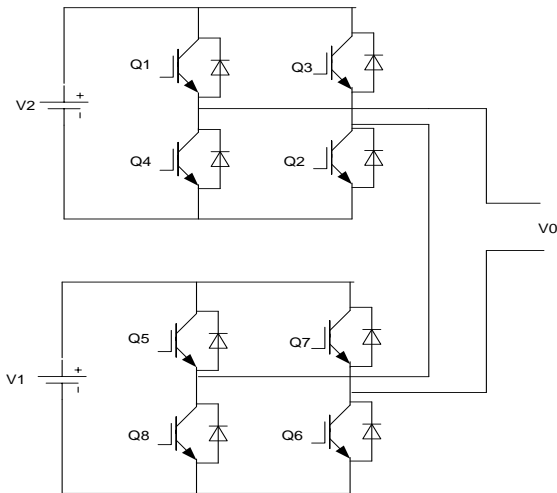
Figure 2. Five level cascaded H-bridge multilevel inverter

Modes Of Operation

The input voltages V1=40V and V2=40V are given. The switches Q1, Q2, Q5 and Q6 operate to produce the output voltage Vo=80V. The switches Q1 and Q5 operate to produce the output voltage Vo=40V. The switches Q1, Q2, Q5 and Q6 operate to produce output voltage Vo=0V. The switches Q3 and Q7 operate to produce the output voltage Vo=-40V. The switches Q3, Q4, Q7 and Q8 operate to produce the output voltage Vo=-80V. Thus staircase output voltage waveform is generated as shown in table 2.

Table 2. Eight Modes Operation

Vo	$2V_1$	V_1	0	$-V_1$	$-2V_1$
Q1	1	1	1	0	0
Q2	1	0	1	0	0
Q3	0	0	0	1	1
Q4	0	0	0	0	1
Q5	1	1	1	0	0
Q6	1	0	1	0	0
Q7	0	0	0	1	1
Q8	0	0	0	0	1

Why cascaded multilevel inverter

The cascaded multilevel inverter has the potential to be the most reliable and achieve the best fault tolerance owing to its modularity, a feature that enables the inverter to continue operating at lower power levels after cell failure. Modularity also permits the cascaded multilevel inverter to be stacked easily for high power and high voltage applications. The cascaded H-bridge multilevel inverters have been applied where high power and power quality are essential, for example, static synchronous compensators, active filter and reactive power compensation applications, photo voltaic power conversion, uninterruptible power supplies, and magnetic resonance imaging [2]. Cascaded H-bridge multilevel inverter requires the least number of components for the same voltage level as compared to all three types of inverter [4]. Cascaded multilevel inverter features a high modularity degree because each inverter can be seen as a module with similar circuit topology, control structure, and modulation. With an appropriate control strategy, it is possible to bypass the faulty module without stopping the load, bringing an almost continuous overall availability. H-bridge inverters have voltage boosting capability. It is highly reliable with lowest voltage unbalance problem. The CHB multilevel inverters can be divided into two groups from the viewpoint of values of the dc voltage sources: the symmetric and asymmetric topology. In the symmetric topology, the values of all the dc sources are equal. In the asymmetric types, the values of the

dc voltage sources of all H-bridges are dissimilar. The major advantage of asymmetric topology is its ability to create a substantial number of output voltage levels by using a low number of dc voltage sources and power switches but the high diversity in the magnitude of dc voltage sources is their most outstanding disadvantage.

Sinusoidal Pulse Width Modulation

In this method of modulation, several pulses per half cycle are used. Instead of maintaining the width of all pulses, the width of each pulse is varied proportional to the amplitude of a sine-wave evaluated at the centre of the same pulse. By comparing a sinusoidal reference signal with a triangular carrier wave, the gating signals are generated [1].

Good quality output voltage in SPWM requires the modulation index (m) to be less than or equal to 1. For m>1 (over-modulation), the fundamental voltage magnitude increases but at the cost of decreased quality of output waveform [3].

The switching moments and commutation are established by the intersection of the carrier signal v_c and the reference signal v_r. By varying the modulation index M, the rms output voltage can be varied. Each pulse corresponds approximately to the area under sine wave between adjacent midpoints on off periods on the gating signals [5].

Pi Filter

Pi filter consists of a shunt capacitor at the input side, and it is followed by and L-section filter as shown in Figure 3. The pulsating DC output voltage is filtered first by the capacitor connected at the input side and then by another choke coil and then by another shunt capacitor. This filter is also called capacitor input filter.

The ultimate aim of a filter is to achieve ripple free DC voltage. In pi-filters, the major filtering action is accomplished by the capacitor t input C1. The residual AC ripple are filtered by inductor coil L and capacitor C2.
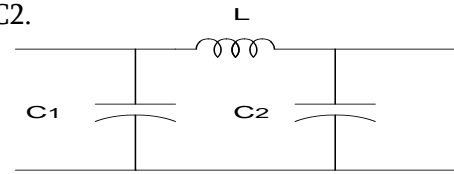
Figure 3. Pi filter

Advantages of pi-filter

Pi filter offers low voltage drop across choke coil and capacitor C2 in order to maintain high output voltage across its output terminals. Due to the involvement of two capacitors in addition with one inductor, pi filter provides improved filtering action. The peak inverse voltage in the case of pi filters is more in comparison to L-section filter.

Disadvantages of pi-filter

In an application where load current varies, pi-filters are not suitable.

II. SIMULATION RESULTS

Simulation of single phase five level cascaded H-bridge multilevel inverter without filter.

Figure 4. shows the pulse generation for MLI circuit by comparing the sinusoidal waveform with triangular waveform.
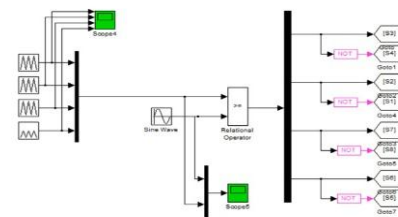
Figure 4. Pulse generation for MLI circuit

Figure 5 shows the pulse generation using carrier signal and reference signal.
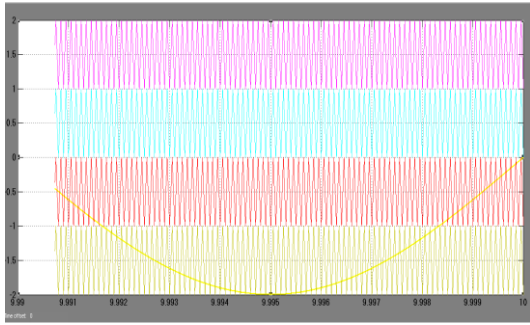
Figure 5. Pulse generated using carrier signal and reference signal.

Figure 6 shows the design of single phase five level cascaded H-bridge multilevel inverter without filter. Input supply, Vdc of 12 V is given and the R-load is of 100 ohms.
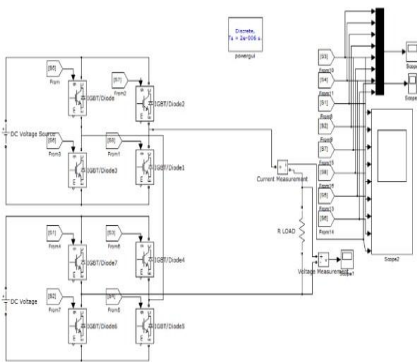
Figure 6. Design of single phase five level cascaded H-bridge multilevel inverter without filter.

Figure 7 shows the output voltage waveform of single phase five level cascaded H-bridge multilevel inverter without filter.
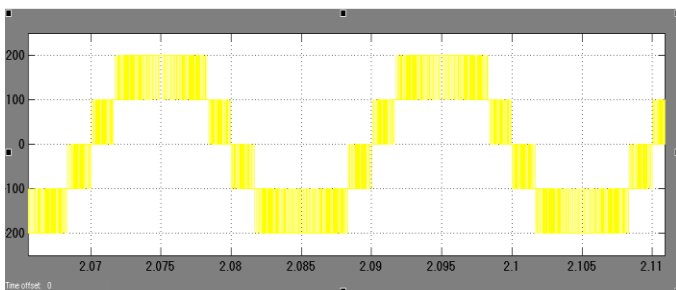
Figure 7. Output voltage without filter

Figure 8 shows the THD analysis of output voltage without filter.
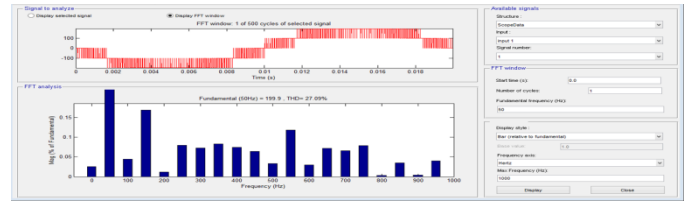
Figure 8. THD analysis of output voltage of single phase five level cascaded H-bridge multilevel inverter without filter. (THD=27.09%)

Simulation of single phase five level cascaded H-bridge multilevel inverter without filter.

Figure 9 shows the design of a single phase five level cascaded H-bridge multilevel inverter with pi filter. The output of the pi filter is connected to the resistive load.

Parameters for filter are taken as:-

L=0.24H

C1= C2=13.86 µF
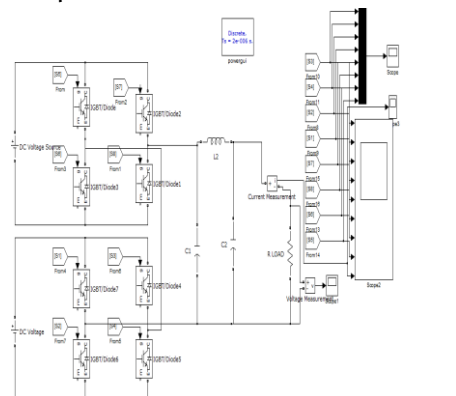
Figure 9. Design of single phase five level cascaded H-Bridge multilevel inverter with pi filter.

Figure 10 shows the output voltage waveform of single phase five level cascaded H-bridge multilevel inverter with filter.
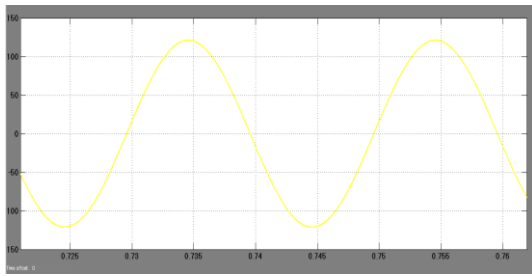
Figure 10. Output voltage with filter

Figure 11 shows the THD analysis of output voltage with filter.
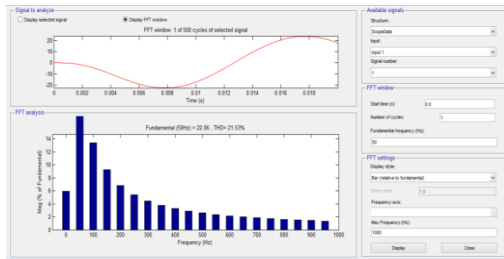
Figure 11. THD analysis of output voltage of single phase five level cascaded H-bridge multilevel inverter with filter. (THD=21.53%)

Comparison of THD values

Table 3 compares the THD values of the multilevel inverter with and without filter.

Table 3. THD Values

	Single phase five level cascaded H-bridge multilevel inverter with R-Load	
	Without filter	With filter
%THD	27.09	21.53

III. CONCLUSION

In this paper, the total harmonic distortion in multilevel inverter with and without filter is compared. The THD reduces when the filter is used and hence the power quality is improved. The %THD in multilevel inverter without filter is found to be 27.09 and that in multilevel inverter with filter is found to be 21.53.

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"Synergy between Films and Literature"

Nuzhat Rizvi, **Nawaz Khan**, **Sajid Kazi**

Department of Humanities, Anjuman College of Engg & Tech., Nagpur, Maharashtra, India

ABSTRACT

The present paper aims here to bring forward the synergy between films and literature. Do movies based on popular books increase the popularity of the author and do popular books make popular movies? Is there a symbiosis between the popularity of the film and popularity of the author? Literature is an aspect of popular culture which has immense power to establish a grip on the people's mind and is perhaps one of the oldest forms of entertainment. Film makers adapt scripts from literature to recreate and add new freshness to the already existing world. More over the audience is drawn to the cinematic adaptation due to the possible opportunity offered by the film, to see and hear what they have thought and imagined while reading the book. It may be implied that successful movies reflect on literary longevity.

Keywords: synergy, films, literature, authors, film makers, symbiosis, entertainment, cinematic adaptation, literary longevity.

I. INTRODUCTION

"The study of literature casts light on the meanings in the film and the study of the film can illuminate the full value of literature"

Ronald Perrier

Films and literature are forms of art designed to empower each other .Over the years great literature has influenced film makers all over the world. Time is witness to adaptations of books into cinema and the concept is nothing new for our Indian film industry. We have seen that from the Shakespeare to Ruskin Bond, Indian cinema has been influenced by popular books, which have ignited the minds of film makers.

Literature has a long standing and important element of popular culture, and has been closely integrated and adapted into films. The kind of relationship that exists between films and literature is one of the most occupied concepts by the theorist, critics and even the ordinary film goer. Literary adaptations into films invite us to discover their relationship and explore the various issues. The effort here is to bring forth the synergy between films and literature, movies based on popular books – do they increase the popularity of writer and do popular books make popular movies. Is there a symbiosis between the popularity of films and the popularity of the author?

II. FACTORS CONTRIBUTING TO THE SYNERGY BETWEEN FILMS AND LITERATURE

It has been observed that by the end of the 19th century that, there was a definite shift from 'telling' to 'showing' and the visual media started gaining

popularity in the various countries. Films have a more direct sensory experience as compare to reading.

Let us see what lures the film makers towards literature. Generally, it is the strong urge to recreate and add new freshness to the already familiar world. Moreover, the audience is drawn to the adaption due to the possible opportunity offered by the film, to see and hear what they have thought and imagined while reading their favorite book. Moreover, fascinated by a writers creation, film makers find it alluring in sharing the creative experience of the author and the curiosity to learn that how an aesthetic work can be transformed into cinematic medium.

Relevant here are the remarks that, "Film adaptation in a way blurs the boundaries between different media. The complexity of a literary work represents a great challenge to every reader because the world it evokes is an open-ended world that is left to be completed in the process of reading. The readers create their own private ideas about this world by piecing together fragmentary visions of both the directly articulated and indirectly suggested parts. An adaptation invites the viewers to discuss not only the film itself but also their private readings of the adapted text, for it gives them an opportunity to see how the cinematically active readers have responded to the book. When we watch the film, our private form of filling in the gaps is revitalized by the confrontation with the way another creative mind has filled in the same gaps. We become part of an interpersonal artistic communication which is very rewarding because it allows us to get insight into an artist's creative mind and through this creative mind to the literary work. This combines the pleasure in exploring the literary text through the lenses of an artist with the pleasure in

participating in the inner world of that artist. We are interested in the way the authors of the film respond to the significant parts of the literary work, how they transform the relations between the characters, structures and objects, how they mold the characters, how they add richness to their portrait, how they reconstruct the latent subtexts and how they shape visually and aurally all that lies beneath the surface."[MALGORZATA MARCINIAK THE APPEAL OF LITERATURE OF FILM ADAPTATION]

The reason for a cinematic adaptation to be more enjoyable is that it combines the abstract world of a literary text with images and sounds and brings literature back to its original unity of spoken word assisted by music and accompanied by the physical presence of the performers. This bodily presence of a human being seems to attract more forcefully to our senses and is the starting point of another sort of pleasure – the fascination with the performing artist.

These factors contribute to develop a symbiotic relationship between films and literatures or to say film makers and authors. Moreover, ordinary filmgoers are more attracted to the cinematic medium may be because it takes longer time to read a book than to watch a movie. Besides books require us to translate written words to mental images, where as movies instantly present out those images assisted by sounds, visuals emotions exploding around us. The end results though much the same… catharsis comfort escapism and entertainment.

A significant remark here is, "Literature is an aspect of popular culture which is widely regarded as having immense power to establish a grip on an individual's mind, owing to its ability of triggering off curiosity and a film expertise in the art of

storytelling. It's also one of the first modes of Entertainment that was made available to the society, which later transformed into means of preserving history and cultural heritage of a civilization. Literature grew in its influence on the masses, as it moved from fiction to nonfiction. More realistic fiction evolved to become a mirror for the society that portrayed reality more visually. Whether it was a more colorful, darker, a stinging portrayal of existing realities, or a way to neutralize the bitterness with art, literature has been the instrument of the best story tellers." [LITERATURE IN HINDI CINEMA LOST IN TRANSLATION]

It may be noted that, most of the Indian population wouldnot be able to appreciate Shakespeare's work because they are not oriented with the British literature.In the same way,not everybody can appreciate the lyrics of Bohemian Rhapsody and the beautifully executed ballad and the brilliant guitars solo. Some people need a Florida or Pitbull to make music that they can groove to when in a club. In short, there will always be a wide spectrum of writers with appeal to various segments of the consumers market. Chetan Bhagat appeals to the majority of Indian youth owing to his simplistic writing and choice of subjects. He has spawned a generation of readers.

Relevant here are the remarks of Purvi Thaker, in her scholarly paper, "Filmmakers have realized that for a good film they need a well-knit plot, effective characters and an interesting story. People are fed up with age old film formula of romance, tragedy action with same old story. They look for some novelty. Novels can provide novelty. Moreover, books are written and read by elite and educated class whereas films can be seen and understood by the illiterate people too. Film watching is not a costly activity even the lower class can afford to

watch movie. This reason also makes movie adaptation a desirable activity."

"Shakespeare also did the same thing he found stories from different sources and converted them into plays. This transformation from one genre to another helps 'a good story' to have 'a good form' of representation. Critics of film adaptation condemn this practice and try to prove superiority of books over films. Many critics are of the view that by movie adaptations 'they are condescending from the act of reading to the act of watching a film, to then a "lesser" art form." (A Critical History of Film Adaptation) And so they have expressed their preference for the traditional experience for book reading. "New aesthetic ideas as well as technological innovations might make a film more interesting or more marketable, but it does not necessarily make it better.

Thus novels and film adaptations should be evaluated on their unique attributes." (A Critical History of Film Adaptation) this attitude developed because literature has been established as a discipline for centuries while film is a recently acknowledged discipline it is true that novel form is older and film is a younger form of expression but it is rapidly acquiring popularity among people and critics alike."[MOVIE ADAPTATION OF LITERARY WORKS IN HINDI CINEMA]

Even in the Indian cinema, movie adaptation is not a new concept. The first Hindi film by Dadasaheb Falke Raja, Harish Chandrawas based on a story from Indian epic the Mahabharata. Besides there is a host of authors whose novels have been transformed into movie. R.K. Naryan's Guide, Devadas of Sharatchandra Chattopadhyaya and, Amrita Pritam's Pinjar are few of them. Recently, there has been

seen a revival of the popular trend to adapt popular English novels into films in Hindi cinema too.

This trend again is becoming popular. In 2008, The New York Times cited Bhagat as "the biggest selling English language novelist in India's history". Times magazine named him as one of the 100 most influential people. Chetan Bhagat the most popular and renowned writer gives credit of his success to films. In his interview with NDTV, he said, "I like to reach more Indians, and movies help me do so. The bigger the audience I have, the more likely they are to read my non-fiction columns on national issues or be interested in my views. Movies help me do that." Out of Chetan Bhagat's five novels, four have been rendered into movies: Five Point Someone into 3 idiots (2009), One Night @ the Call Center into Hello (2008), The 3 Mistakes of My Life into Kai Po Che(2013), 2 States (2014) by the same name. Vishal Bhardwaj's trilogy.. Maqbool, Omkara and Haider adapted from the plays of William Shakespeare- Macbeth, Othello, Hamlet has attracted the Indian readers to the classics of Shakespeare. The list of adaptations is elaborate. Movies based on Jhumpa Lahiri's- Namesake or on the novel Emma have attracted the common readers to the book as well. The recently released movie "Jungle Book" has enticed the kids to read the original book.

Royalties from her adaptations have helped make Harry Potter author J.K Rowling the second richest women in entertainment, as well as the richest author in history. Whenever a book is transformed into a movie its message reaches to even those who refrain from reading. Take the example of Chetan Bhagat's novels. The rendering of his novels into films has made him a very popular and successful writer. There has been seen increase in rate of the viewership of the films as well as in the readership of his novels also.

Purvi Thaker puts "By movie adaptation, the creator does a great job for the viewers. When a reader reads a novel, there remain certain gaps in understanding the text because it is not possible for every reader to analyze the subtext, symbols and mystified ideas of the text. The aural, visual presentation helps him to understand the implicit meaning. Sometimes it happens that we cannot read a novel at a stretch so our experience is sporadic and understanding is not clear. When we see a movie we can have the experience in totality. As a result, we can draw more interpretations. E.g. while reading The 3 Mistakes of My Life I found it little confusing but when I watched Kai Po Chhe the topic is understood properly and could find a new meaning of the title. I could understand which the three mistakes of the protagonist were."

"Classic novels deep on publisher's backlists often have second lives when Hollywood admirers bring them back to the public's attention. Take Far From the Madding Crowd— Thomas Hardy's breakout novel is more than 140 years old, but it recently got fresh play in bookstores thanks to the charming new movie starring Carey Mulligan based on Hardy's story of Bathsheba Everdene and her various suitors. Once a book enters the public domain, which can vary depending on when it was written but is often about 70 years after the death of the author, anyone can publish an edition. That's why a book like Far From the Madding Crowd has more than a dozen editions. On the other hand, newer books are usually protected by copyright, so only one publisher has permission to print them." [HOW MOVIES GIVE NEW LIFE TO OLD CLASSIC]

I refer to an article which observes that, On Friday, the movie The Maze Runner hits theaters. The big-screen version has been adapted from a book of the

same title, written by James Dashner in 2007. Thanks to the movie—and perhaps contrary to what you might think—kids all over the United States are picking the book up before they see the film. According to data from Renaissance Learning more than 10,000 students read The Maze Runner last May, compared with fewer than 3,000 in 2011 when the movie deal was announced. It turns out that movie releases do in fact spur kids to read the books they're based on. Just look at The Hunger Games, one of the more obvious example of the movie bump. In February of 2012, the month the movie was released, about 70,000 school kids read the book. In April, the month after the movie's debut, 180,000 students were turning the pages of The Hunger Games. The same goes for The Lorax, which saw a huge spike in readership the month the movie was released. [KIDS ACTUALLY READS THE BOOKS THAT MOVIES ARE BASED ON]

We can only wait and watch that how the bestselling novels transform into blockbusters films and how long are film makers drawn towards literature. As Jean-Luc Godard has rightly said that "it is not where you take things from-it is where you take them to."

III. CONCLUSION

It may be summed that the relationship between films and fiction has often resulted in the increase recognition for the author and the novel. However, these two different medium have won millions of fans all over the world. Actually we may say that, Films and literature are two different roads which lead to the same destination, they may often cross paths and it may also be added that 50% of commercial movies are adaptations from famous books. There is a symbiotic relationship between literature and films, though interrelated still they are independent forms of art.

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"Portable Water Filtration Unit on a Bicycle."

Prof. R.N.Dehankar*1, Aaquib Kamal2, Atif Jamal2, Sabate Shabbir2, Sufiyan Sani2, Fazal Akhlas2, Mohammad Inzemam2, Usman Gani2

1Department of Mechanical Engineering Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

2B.E Mechanical Engineering, Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

The project is designed to create a feasible water purification system powered by a conventional bicycle. Treatment for drinking water production involves the removal of contamination from raw water to produce water that is pure enough for human consumption without any short term or long term risk of any adverse health effect. This paper focuses on combined use of different components such as a peristaltic pump (powered by paddling on bicycle), filter (here two candels one of cotton and one of activated carbon). This project will help to sort out problems on need of clean drinkable water in villages facing such water crises and villager have to travel long distance for their basic need of clean drinkable water and on the other hand providing a more feasible solution for transportation of water.

I. INTRODUCTION

The world contains a estimated 1,400 million cubic km of water out of which only 0.003% of this vast amount, about 45,000 cubic km, are what that theoretically can be used for drinking, hygiene, agriculture and industrial purposes. But not all of this water is accessible.

The distribution of the locations of water on earth is only 3% of earth's water is fresh water. Most of it is in ice caps and glaciers 69% and ground water 30% while all lakes, rivers and swamps combined only account for a small fraction 0.3% of the earth's total fresh water reserves.

Domestic use of water: it is estimated that 85 of worldwide water use is for domestic purposes like drinking water, bathing, cooking, toilet flushing, cleaning laundry and gardening basic domestic water requirements have been estimated by Peter Gleick at around 50 lits per person per day, excluding water for gardens.

Problem statement:

In the developing world the availability of clean water is often consuming and expensive. Countries around the world face challenges accessing safe and clean drinking water. Alarming statistics led to the idea that we could use a simple mechanism of transportation that is common in villages, such as bicycle, to help aid their water and sanitation struggles.

Proposed solution:

We propose building a compact bicycle powered system that can collect, purify and transport water. In order to make our solution as accessible as possible, total manufacturing cost and materials available will be considered as our significant constraints. We will design some kind of apparatus for any bicycle to fulfill the three goals of collection, purification and transportation. We will do this by using an old bicycle, an old bike rack, and readily available other parts (peristaltic pump, activated carbon filter and storage tanks).

II. II.LITRATURE REVIEW

On reviewing different journals paper related to purifications and transportation of drinkable water it is found that pure water is an essential need of human race.

III. METHODOLOGY

Construction:

The setup consist of a storage tank, water filter, clutch, peristaltic pump and a clean tank for storing the filtered water all mounted on a bicycle. The water is firstly filled into the primary storage tank, as the rider paddles the bicycle, the peristaltic pump draws the water from water storage tank passing through a filter mounted between the tank and pump. This filtered water travel to the clean tank provided for storage of clean water.

Working:

A bicycle is used for this purpose with the general arrangement and the type of pump is peristaltic pump. A peristaltic pump is a positive displacement pump used for pumping a variety of fluids. The fluid is contained within a flexible tube fitted inside a circular pump casing. A rotor in the form of plate with a number of "rollers", "shoes" or "wipers" is attached to the external circumference and connected to the sprocket. An operator sits on the seat and pedals, the pedal crank transfer the motion to the rotor thus the tube is squeezed by the set of rollers and move the fluid.

By constricting the tube and increasing the low-pressure volume, a vacuum is created to pull the liquid into the tube. Once in the pump, the liquid is pushed through the tube by compressing the tube at a number of points in contact with the rollers.

The media is moved through the tube with each rotating or oscillating motion. The water is then forced through a filter.

Working of Peristaltic pump:

The peristaltic pump is based on alternating compression and relaxation of the hose or tube drawing the contents into the hose or tube, operating in a similar way to our throat and intestines.

A rotating shoe or roller passes along the length of the hose or tube totally compressing it and creating a seal between suction & discharge side of the pump, eliminating product slip.

Upon restitution of the hose or tube a strong vacuum is formed drawing product into the pump. The medium to be pumped does not come into contact with any moving parts and is totally contained within a robust, heavy-duty hose or a precision extruded tube.

This pumping action makes the pump suitable for accurate dosing applications and has a pressure rating up to 16 bar (hose) and 2 bar (tube).

The high pressure hose has inner layer of 2-6 reinforcement layers and an outer layer, which allow higher working pressures and generate higher suction lifts than non re-enforced tubing.
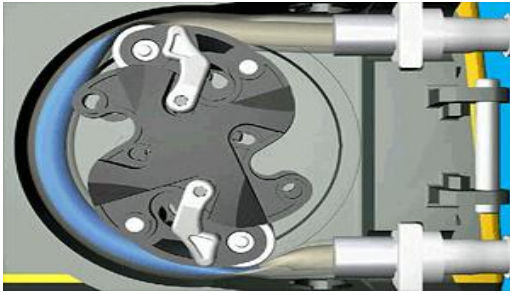
Figure 1. Peristaltic Pump
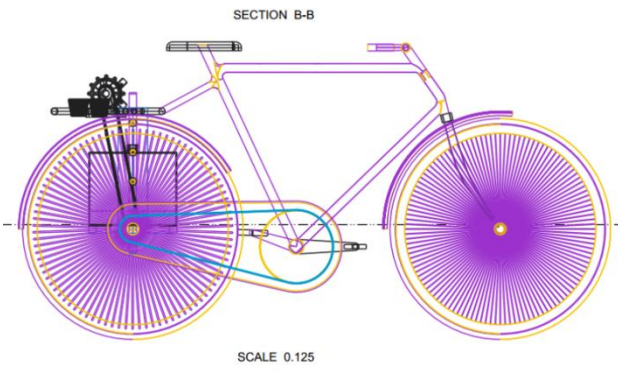
Figure 2. 2D wireframe-side view
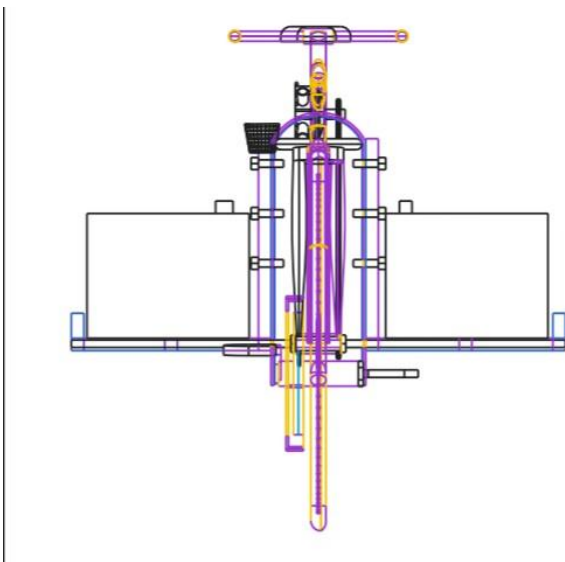
Figure 3. 2D wireframe- when viewed from back side

IV. CONCLUSION

This project presents a solution to meet the basic requirement of safe and clean drinkable water using readily available resources bicycle, bike rack, a peristaltic pump and activated carbon filter and eliminating the use of electricity for filtering, fuel consumption for transportation.

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Expansive Soil Stabilization by Using Walnut Shell Powder Ash

Rashmi Bade*, Saqueeb Ali, Sumit Rathod, Mohd. Atif Khan

Department of Civil Engineering, Rashtrasant Tukadoji Maharaj Nagpur, University/ Anjuman College of
Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

Black cotton soil is basically an expansive soil which is susceptible to high change in volume as water content fluctuate vary irregularly. The bearing capacity of black cotton soil is too low. High shrinkage and swelling exists. Montmorillonite mineral is found in these type of soil. This variant of soil is frail and need to be improve for construction and foundation work. To improve the SBC of soil by using waste admixtures can add to intensify the index properties of an ungraded soil mostly in an economic way. Percentage of additives to the soil is taken and hence the improvement of soil is observed gradually with increase in percentage of additives. Composition of Walnut shell powder ash is SO_3 (2.2%), P_2O_5 (6.2%), SIO_2 (9.9%), Fe_2O_3 (1.5%), AL_2O_3 (2.4%), CaO (16.6%), MgO (13.4%), Na_2O (1%), K_2O (32.9%), TiO_2 (0.1%) are acceptable for improvement of expansive soil. To compute index properties of soil tests are to be conduct.

Keywords: Walnut Shell Powder Ash, soil Property, Waste utilization

I. INTRODUCTION

In this modern time lack of resources are observed because of population growth. Due to which the city or town need to expand more even on the areas where low quality of soil exists. These type of soil it is not suitable to be used for construction as well as foundation works. Thus improvement of SBC soil is obligatory. The method of improvement of soil is term as 'Stabilization' as per the aspect of civil engineering. In other words the method of improvement of soil with a purpose that the improved soil can sustain the load of the structure is Soil Stabilization. Stabilization can be classified into two categories i.e. mechanical and chemical stabilization.

Reuse of the waste material is on the main focus entirely. Stabilization by waste material is economical as well as easy accessible. The aim of this project is to improve the SBC of soil by using waste product i.e. Walnut Shell Powder Ash. The shells of walnut are crushed well in a grinder and passed through 425 micron IS sieve and thus a fine powder ash form is obtained

II. WALNUT SHELL POWDER ASH

Crushed walnut shell is a hard fibrous material ideal as abrasive. Its grit is highly durable, angular and multi-faceted, yet considered a soft abrasive. This very fine particle size passes through 425 mm IS sieve and so a light brown powder is obtained. It is natural, non-toxic, biodegradable, reusable and compatible with anionic, non-ionic & cationic surfactants.

BEFORE

AFTER

III. CHEMICAL COMPOSITION

Table 1

SR. NO.	CHEMICAL NAME	COMPOSITION
1	SO_3(Sodium trioxide)	2.2
2	P_2O_5(Diphosphorous pentaoxide)	6.2
3	SiO_2(Silicon dioxide)	9.9
4	Fe_2O_3(Ferrous oxide)	1.5
5	AL_2O_3(Aluminium	2.4

	oxide)	
6	CaO(Calcium oxide)	16.6
7	MgO(Magnesium oxide)	13.4
8	Na_2O(Sodium Oxide)	1
9	K_2O(Potassium oxide)	32.9
10	TiO_2(Titanium dioxide)	0.1

IV. OBJECTIVE OF THE PROJECT:

1. To determine the engineering behavior and geotechnical properties of soil with Walnut Shell Powder Ash.
2. To improve the soil.
3. To reuse the waste material Walnut Shell Powder Ash .

V. METHODOLOGY

The methodology undertaken to achieve the objective of this Project is stated as follows. Various experiments have to be done to determine index properties as well as engineering properties of the soil and the changes after addition of additives to the soil are also resolved.

Results Of Untreated Soil:

Table 2

Sr. No	Experiment Names	Results
1	Water content of soil	40%
2	Specific gravity of soil	2.1
3	Dry density of soil	15.23
4	Liquid Limit of soil	44.9%
5	Plastic Limit of soil	14.51%
6	Plasticity Index	30.39%
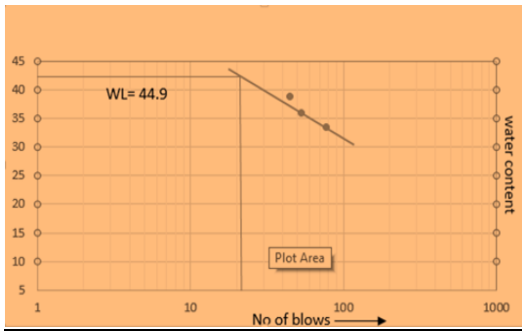
Graph 1. of Liquid Limit of soil

PI = 30.39 > 17

Therefore It Is Concluded That:

1. Soil is highly plastic, highly cohesive soil.

2. Soil is not good for construction as well as foundation material.

3. Strength of soil has to be increased.

4. Walnut Shell Powder Ash was added with soil at proportion of 5%, 10% and 15% and the results are detailed below:

VI. RESULTS OF CONSISTENCY LIMITS FOR TREATED SOIL.

Table 3

Ratio Of Additive	Liquid Limit	Plastic Limit	Plasticiy Index
5%	44.9	24.6	20.3
10%	40	31.74	8.26
15%	37.4	34.44	2.96

VII. CONCLUSION

A. Original soil was highly plastic, highly cohesive therefore additive Walnut Shell Powder Ash was added to the soil.

B. Addition of Walnut Shell Powder Ash gives the value of plasticity index of treated soil. The plasticity index of treated soil is observed less than the original soil, hence soil is improved.

C. Index properties of soil is increased.

D. Improved soil can be used for construction as well as foundation material.

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Survey on Office Automation System

Prateek Swamy¹ , Chinmay Lokhande² , Akansha Rangari² , Kunal Burangi² , Samiksha Manusmare² , Ruchira Band² , Ankita Dhabalia²

¹Assistant Professor Department Of Computer Science And Engineering S. B. Jain Institute of Technology, Management and Research, Nagpur, Maharashtra, India

²Student Department Of Computer Science And Engineering S. B. Jain Institute of Technology, Management and Research, Nagpur, Maharashtra, India

ABSTRACT

Office automation refers to the varied computer machinery and software used to digitally create, collect, store, manipulate, and relay office information needed for accomplishing basic tasks which helps in optimizing or automating existing office procedures.

It provides advanced facilities to different organizations and institutions. It Reduce the paper work and to modify into online system and comprise raw data storage, electronic transfer, and the management of electronic business for office work.

Keywords: Office Automation, Raw data Storage, ERP System.

I. INTRODUCTION

A smart office is something that ensures effective and optimal utilization of IT resources and physical infrastructure. In today's generation of information technology, offices are automated. Office automation among other things facilitates real time communication and easy documentation.

It is necessary to provide tools that can do the administrative process fast and correctly, using of office automation system as a novel method of direction accelerates the process. On the other hand, gathering data collections of organization activities and their classification provides an appropriate bed to accelerate every tasks.

The overall goal is to improve manager's decision making process to achieve the goal, to provide appropriate information such as validity, accuracy, timeliness and economical, offering solutions to improve automation system.

A. Goals or Objectives:
- ✓ To reduce work load by minimizing human efforts.
- ✓ To get Office Automation many tasks accomplish faster.
- ✓ To make it sustainable in office environment.
- ✓ To allow manipulation and storage of data.
- ✓ To get many people simultaneously update data so as to improve multitasking.

II. LITERATURE SURVEY

"Enterprise office automation system design and implementation" - This is a website which deals with JSP and Framework STRUTS and how it is used to manage internal management requirements.

"The Research and Application of Office Automation Notice Analysis Expert System" - This research paper is for For notice analysis expert system such as inference engine, knowledge acquisition is being used.

"Research the office automation system software based on workflow technology" - It is a research paper which explains that Digital office environment is given by Internet/Intranet used by SQL server 2003 database.

"Design and implementation of Office Automation System based on J2EE Architecture" - This presents the design and implementation of Office Automation System based on J2EE.The paper provides the design of data program.

"Office Automation: A challenge Better tools simplify some office tasks, but serious problems block the integrated office of the future" - This research paper highlights the use of Office Automation in simplifying office tasks and possible problems that can occur in future.

III. PROPOSED WORK

The Office Automation is an ERP based software system. The complete flow of the system and the functional modules of the system are as follows:

A. Flow of the system

There is a separate login section for student , admin ,employee, Administrator , accountant and HR. Each section verifies the user and checks whether the user is authenticate or not. The every new user need to register first and then only can use the system. After login each user can jump to their respective profiles where they have various tabs of their responsibilities.

The administrator is responsible for doing enquiry, granting admission to the institute, conducting exams , analysing student performance and maintaining faculty details belonging to institute. The person can also organize events and provide his feedback.

After performing their tasks the users had to logout from the system for the security of the system.
The flow of the system is as follows:
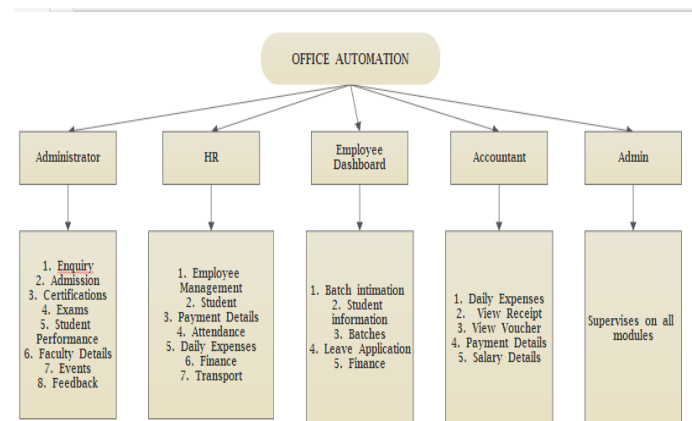
Figure 1. Flow Diagram for Office Automation System

B. Functional Modules:

The whole system is divided into five modules: Administrator module, HR module , Employee Dashboard, Accountant module, Admin module.

1) Administrator Module:

The administrator is responsible for doing enquiry, granting admission to the institute, conducting exams, analysing student performance and maintaining faculty details belonging to institute. The person can also organize events and provide his feedback.

2) HR Module:

The HR module is responsible for Employee Management, managing students , maintaining payment details, attendance, and handling daily expenses. It also handles finance and transport.

3) Employee Dashboard:

Employee Dashboard is responsible for maintaining batches of various courses i.e. Batch Intimation. It also maintains student information , batches and it can leave application. It is also responsible for finance.

4) Accountant:

The accountant maintains daily expenses of the institute, it can view receipt, view voucher , maintain payment details and salary details of the employees.

5) Admin:

The admin is the highest level authority of the system. It supervises on all the module and it has total control over the system and its respective modules.

IV. CONCLUSION

This survey helps in building the system for Office Automation. It aims on reducing the manual efforts to most extent by converting them to automated. It reflects that Automation of the Office is today`s need. It shows how different modules within the office can collaborate with each other and maintains the system to work smoothly. It also facilitates on how multitasking can be achieved and human efforts can be reduced. It focuses on providing advanced facilities to different organizations and institutions. It shows how to reduce the paper work and to modify into online system and Comprise Raw data storage, electronic transfer, and the management of electronic business for office work.

Smart Farming Using Solar Energy

Prof. Rahul U. Ghanmare, Pranali Kamble ,Ganesh Tambade, Shweta Zode, Vikas Tambade, Satish Mohod

Department of Electrical Engineering, Dr. BabasahebAmbedkar Collage of Engineering and Research,Nagpur., Maharashtra, India

ABSTRACT

This project has been made to develop automatic smart farming system by using solar energy .The major drawbacks of conventional farms require large effort, more energy and excess amount of water .Therefore, we have fabricated smart farming system to make improve irrigation and protection of farms. In this irrigation system, we are making the use of soil moisture sensor which senses the humidity of soil and supplies the water as per the requirement of the soil through drip to distribute equal amount of water to the whole farm. Also, we have designed a sounding bell we makes sound by the rotating rod. With the help of this sound, we are able to protect the crops from animals and birds who enter into the farms in search of their food.

Keywords : Solar Energy, Smart Farming

I. INTRODUCTION

The energy used in agriculture has risen in the recent decades .Energy is used directly in farm activities such as fertilization, irrigation and indirectly in different forms. The other forms may be providing protection to the crops from sounding bell which will rotate with the supply of solar energy and terrify animals making them scared of the noise so that they will feel that someone is present in the fields and will leave the field in the fear of sound. Hence, this paper provides the protection to the   fields with the help of solar energy which is renewable and environment friendly. It reduces the human effort and also replaces the use of scarecrow. Hence, the optimization of energy use has been achieved through the use of smart farming.

Solar energy is one of the promising alternatives to the fossil fuels based energy source. Solar energy based water pumping system is efficient and cost effective for livestock - watering, irrigation purposes and for supply of water. It has some more advantages like non-polluting, does not emit any greenhouses gases or harmful waste, used for low-power purpose as well as larger ones requires very little maintenance for many year.

SOLAR POLICY OF INDIA

India is located in northern hemisphere, lying between latitudes 8oC'N and 37o6'N and longitudes 68o7'N and 97o25'E .It enjoy around 250-300 days of sunlight a year. Being in the tropical region, evidently India is bestowed upon by abundant solar

isolation. It is estimated that the total solar potential in India is 748GWp and highest untapped potential of 142.31 GWP is in Rajasthan. The first major initiative by government of India in this direction was the establishment of Jawaharlal Nehru National Solar Mission (JNNSM) in the year 2010 as one of the steps under the national action plan on climate change (NAPCC).

The energy policy of India is largely shaped by its need to ensure energy self sufficiency and energy security. Solar energy policy has following major components which are instrumental in boosting the growth of this resource

a) JNNSM

b) Accelerated Depreciation (AD)

c) Generation Based incentives (GBT)

d) Renewable Energy obligations (RPOs)

e) Renewable Energy Certificates (RECs)

f) Tax holidays

g) Net metering

II. IMPORTANCE OF IRRIGATION

In India there are 80% of the total annual rainfall occurs in four months in a year i.e. from mid- June to mid- October. So it is very necessary to irrigate the farm field in the rest eight months of the year.

Most of the states in India give irrigation load during the night time. Considering the conventional method the farmer need to irrigate the farm during the cold weather and it is very difficult to work in the temperature of below 10oC during the night time and requires large amount of water and effort and energy.

While , if the irrigation is made automatic this work contributes not only to save water fertilizers but also ensure uniform watering at right time without manual intervention leading to enhance the quality and quantity of agricultural fields.

Timely irrigation is critical for Indian agriculture. We are yet to have a impact on monsoon over the last one decade monsoon has affected due to climate change factors . The cropping intensity ground water has been depleting and ultimately rain has led to flood. Gravity led irrigation system such as major, medium and minor irrigation has problem with tail end issues.

During sowing and plant growth stages there is need of critical and time irrigation based on crop water requirement.

III. IMPORTANCE OF PROTECTION

Animals in search of their food enter into the farms and destroy the fields. This leads to loss in the crops and farmers suffer the loss in money and they fail to get the desired output of crops .This is the serious problem faced by the farmers and should be taken into consideration. Here, the farmers use the conventional technique to protect the farms from roaming animals and birds, this old technique used by the farmers was less effective and required more effort and that's why we are introducing the smart technique of farm protection.

In this paper we have provided the sounding bell which will make noise on striking the plate and hence the noise will frighten the animals and they will be made sure that someone is present in the field and hence due to the noise they will get afraid

and won't enter the fields. The sounding bell will rotate with the help of motor connected to it. Hence, we may be able to save the crops from animals, birds . And the farmers will get succeeded in the protection of crops. It also replaces the use of scarecrow. The below figure shows the mechanism of sounding bell which is rotating with the help of motor.
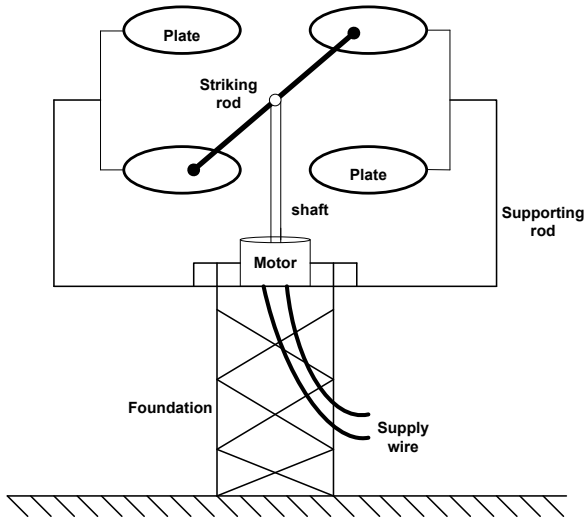
Figure 1. mechanism of sounding bell

IV. ENERGY USED IN AGRICULTURE

Energy is directly used in activities ranging from filed processes such as irrigation of land. Energy is obtained from the sun used to irrigate the land. We use the irrigation method of drip system. The energy stored in the battery which is then converted from DC to AC with help of inverter connected to the transformer. The transformer step-up the voltage level to 220 V . The solar energy is also used to sounding bell.

V. PROPOSED AUTOMATED SYSTEM

The smart farming also includes smart irrigation system which aims at conserving water and energy using drip irrigation method. Soil moisture sensor

are to be used to measure the volumetric water content of the soil . Measuring soil moisture can help in efficient management of irrigation system and can also help in increasing yield and quality of the crops. Soil moisture exceeds a threshold value. The water flow is stopped or decreased depending on the value. Water is made available to the plants when the moisture content in the soil goes below the threshold by in initiating water supply using the relay /reed switches through the microcontroller.

VI. SYSTEM BLOCK DIAGRAM
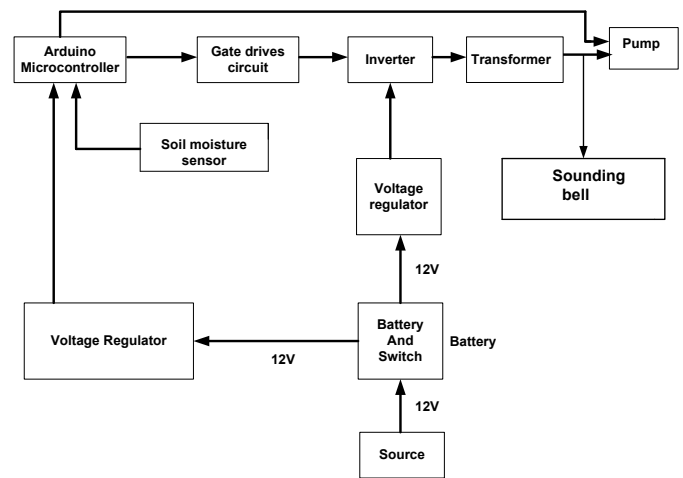
VII. FEATURES

a) It is a cost efficient method of irrigation system.

b) We make the use of solar energy for the irrigation purpose hence using the non-conventional

c) energy resources.

d) Water is equally distributed to crops without wasting it, hence, saving water.

e) This method is effortless and hence saves the, man-work.

f) It can be easily used to protect the farm from roaming animals and birds by making sound.

g) It leads to an increase in the desired output of crops.

VIII. CONCLUSION

In this present investigation, solar panel automatic drip irrigation system was developed for irrigating the farm land by measuring the soil moisture . The subcomponents of this project Arduino microcontroller , solar panel, battery, charge controller , inverter, sounding bell, soil moisture sensor , and other accessories such as submersible pump and drip irrigation .Effective tool for the farmers those who wants to conserve water and who also faces power of shortage at their places where sufficient sunlight is available .With the help of this project , the pump can run maximum for 7-9hours per day with the help of solar panel and battery and 5-7 hours per day without battery taking power directly from solar panel. The automated irrigation system is a feasible and cost effective technique for optimizing water resourses for increase in agriculture production.

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Fabrication of Biogas Pilot Plant for Power Generation

Ahmad Faraz Qureshi[1], Mohammad Muzaffar Hussain[1], Shaikh Gulam Ahmad Mujtaba[1], Prof. M N Nasim[2]

[1]B.E. Student, Department of Mechanical Engineering, ACET Nagpur, Maharashtra, India
[2]Asst. Professor, Department of Mechanical Engineering, ACET Nagpur, Maharashtra, India

ABSTRACT

Biogas is a renewable energy source which can be generated by decomposition of organic waste. The biogas pilot plant refers to the design of the biogas plant being used for minimal purposes & requirements. The reference of the design for the plant is the existing floating dome type structure. Some modifications in the existing referred design are being made to make the plant portable. The apparatus will be used to generate power by the means of a generator and an electrical circuit connected to it. The generator will be powered by the biogas being generated in the tank. The research is carried out to increase the productivity of the gas & and to check for the increment in the efficiency of gas produced by mixing additives, varying the constituents of slurry & pre-treatment of waste.

Keywords: Biogas, Pilot Plant, Efficiency, Additives, Slurry, Pre-treatment

I. INTRODUCTION

Biogas refers to a mixture of different gases produced by the breakdown of organic matter in the absence of oxygen. It can be produced from raw materials such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food waste. Biogas is a renewable energy source. It can be produced by anaerobic digestion with anaerobic organisms, which digest material inside a closed system, or fermentation of biodegradable materials.

Biogas is primarily methane (CH_4) and carbon dioxide (CO_2) and may have small amounts of hydrogen sulfide (H_2S), moisture and siloxanes. The gases methane, hydrogen, and carbon monoxide (CO) can be combusted or oxidized with oxygen.

Organic material grows, is converted and used and then grows in a continuously repeating cycle.

In today's fast growing world of new innovations & technology, we are utilizing the non-renewable energy sources in a huge amount, which not only affects their prolonged production, but is also contributing towards the global environmental hazards & climate change.

The world population is currently relying on the existing available energy sources (carbonized fuels), not focusing on the alternative sources of energy. The carbonized fuels cause greenhouse effect and they will perish with time. On the contrary, biogas, being the renewable energy source, can be used as an alternative for these exhaustible energy sources.

We are concentrating on making the biogas a more viable source for power generation so that the dependency on fossil fuels is reduced.

Applications: Biogas can be used for electricity production on sewage works. In a CHP (Combined Heat & Power) gas engine, where the waste heat from the engine is conveniently used for heating the digester, cooking, space heating, water heating and process heating. If compressed, it can replace compressed natural gas for use in vehicles, where it can fuel an internal combustion engine or fuel cells and is a much more effective displacer of carbon dioxide than the normal use in on-site CHP plants.

II. LITERATURE REVIEW

This research paper includes information & statistics about biogas generation from plant biomass and agricultural waste, addition of waste paper in co-digestion, achievements of biogas from anaerobic digestion i.e. in the absence of oxygen and generation of biogas from different biomass product with waste's hydrothermal pre-treatment.

Some of the important points from the research papers are highlighted below:

i. For per gram VS (Volatile Solids) of raw biomass waste, the order of biogas production potential are as follows: food waste > fruit/vegetable waste > manure > municipal sewage sludge > cow manure

ii. With hydrothermal heating, the biodegradation of biomass waste is improved.

iii. The amount of methane productions of treated manure, fruit/vegetable waste and municipal sewage sludge increased by 14.6, 16.1, and 65.5% respectively.

iv. On the contrary, after heated treatment, the methane production of food waste and cow manure decreased.

v. The effect of waste paper on fixed amount of cow dung and water hyacinth was found to increase biogas production in a parabolic manner.

vi. It was observed that a waste paper concentration of 17.5g is the maximum amount of waste paper needed to combine with 5g of cow dung and 5g of water for maximum production of biogas.

vii. Pre-treatment of manure by separation produces a solid fraction with significantly higher methane potential per unit of volume (55 L/kg FPMF – filter pressed manure fibre) as compared to raw cow slurry (10 L/kg).

viii. Effecting higher dry solids content of feedstock either through agricultural practice or separation techniques may lead to lower transportation costs, smaller facilities and lower thermal parasitic demand.

By adding accelerants in the anaerobic digestion process, the digestion performance is greatly enhanced due to the adsorption of the substrate onto the surface of the additives.

III. MATERIALS & METHODS

3.1. Materials Used

The material being used to produce the biogas is purely cow dung. A part of organic waste is added to boost up the productivity of the gas being generated. The cow-dung and water are mixed in equal quantities of 500kg each. The slurry is prepared by mixing the two components.

The digester tank for the plant is a plastic water tank made up of food grade plastic with a threaded lid. The tank is UV stabilized that imparts high strength to the material. The capacity of the tank is 1000 L.

The collector tank for the plant is of the same material, triple layered with a capacity of 750 L. This collector tank will work as the floating dome of the apparatus. The gas produced starts accumulating at the above wall of the collector tank & lifts it up, indicating that the gas is being generated & getting collected. A maximum gap of 5 cms on either sides of the tank is to be maintained so that the dome can float easily, without any disruption to the digester tank.

3.2. Generation of Biogas

The biogas is produced by following the steps as given below:

i. Slurry is prepared by mixing water in cattle dung in equal proportion in mixing tank.

ii. The slurry is then injected into a digester tank with the help of inlet pipe. The digester tank is a closed underground tank made up of bricks.

iii. Inside the digester tank, the complex carbon compounds present in the cattle dung breaks into simpler substances by the action of anaerobic microorganisms in the presence of water.

iv. This anaerobic decomposition of complex carbon compounds present in cattle dung produces bio gas and gets completed in about 60 days.

v. The biogas so produced starts to collect in floating gas holder and is supplied to homes through pipes.

vi. The spent slurry is replaced from time to time with fresh slurry to continue the production of bio gas.

3.3. Design Modification

Figure 1 shows the existing design of the floating dome type biogas plant. The digester tank described in the figure is below the ground level which creates a black-out environment for the gas to be produced. The inlet & outlet for the slurry & sludge respectively are at the ground level.
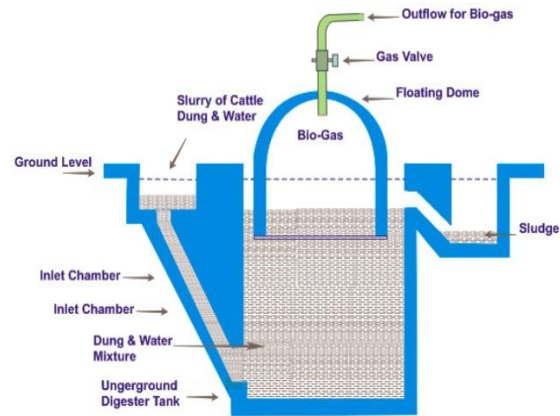
Figure 1. Floating Dome type Biogas Plant

The proposed modification in the design is that the complete setup is above the ground with the digester tank painted black, so as to create the adequate ambience for the generation of gas, as it was for the digester tank below the ground level.

Also, the complete setup will rest on a frame with wheels attached to it that will help to make it portable.

The outlet for produced biogas is connected to an inlet manifold of cylinder block in a generator. The gas from the manifold runs the generator, thereby, generating power.

3.4. Composition & Calorific Value

The composition of biogas produced consists of mainly of methane, carbon dioxide, and nitrogen and hydrogen sulphide. The setup requires only methane gas for power generation as it has quite similar composition and calorific value as that of petrol.

Calorific Value is the energy contained in a fuel or food, determined by measuring the heat produced by the complete combustion of a specified quantity of it, and is usually expressed in joules per kilogram (J/Kg).

The calorific values of various organic materials/fuels such as cow dung, coal, methane etc. gives a very high energy output. A table of the approximate calorific value of various fuels is as given below:

Table 1. Calorific Value of various fuels

Sr. No.	Fuel	Calorific Value (KJ/Kg) (Approx.)
1.	Cow Dung	8000
2.	Wood	22000
3.	Coal	33000
4.	Biogas	40000
5.	Diesel	45000
6.	Kerosene	45000
7.	Petrol	45000
8.	Methane	50000
9.	LPG	55000

The unwanted gases are removed from the composition by the means of extractors, so that a good quantity of pure methane gas is achieved.

IV. CONCLUSION

The biogas can be used as a replacement for fossil fuels or as a hybrid energy source that can reduce the dependency on carbonized fuels. The design modification is made portable so that it is easy to shift the setup to the desired location. Also, the pilot plant is economical as compared to the existing design of floating dome type. The setup of pilot plant can be used in the rural areas where there is shortage of power. As the cattle waste is present in abundance in the rural areas, the biogas can be a substitute for electricity being produced by thermal energy that is supplied to such areas. This can be of advantage to the small farmers who have less energy consumption requirements for their household purposes. Also, the biogas produced can be used as a cooking gas as it has good calorific value and the colour of the flame produced is completely blue, that indicates the absence of harmful and unwanted gases in its composition. Thus, the economical design of pilot plant can be used in housing societies to power the corridors and parking areas. The municipal loads can be divided by using biogas as an equivalent source of power generation.

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"Role of Schemes for Minority Community Welfare in India. With Special Reference to Muslim Community"

Abdul Sajid Quazi, Nuzhat Rizvi,Nawaz Khan

Department Humanities, Anjuman college of Engg. & Tech., Nagpur, Maharashtra, India

ABSTRACT

National Minority Commission has identified Muslims as minorities along with Christians, Sikhs, Buddhists and Jains on the basis of religion. Out of these religious minorities Muslims are the largest ones. In spite of being the largest minority they are lagging behind in education and economic in comparison with other religious minorities. Literacy which is a first step to education is lowest of the Muslim minority and inter-state variation in their literacy rates is also very high. In the light of these contexts, this paper presents a brief discussion of schemes, policies and programs implemented for the development of the minority. Thereafter, the paper tries to explain the functions of schemes in terms of objective, access, participation, retention of Minority students in the states.

Keywords: Minority, education, schemes, educational development, Muslims, India

I. INTRODUCTION

After the independence (1947), initiatives for educational development for minorities were started in India, in late 1970s, which geared up after the National Policy on Education (NPE), 1986 and its Program of Action (POA), 1992. Both the NPE and POA emphasized the need of special efforts, "to bring the educationally backward minorities (which include Muslims) on par with the rest of the society and to make them participate fully in the national development activities" (GOI, 1992, p. 9). Many long term and short term programs were started in the form of affirmative actions to improve the educational status of minorities like: Prime Minister's 15 Point Programme for the Welfare of the Minorities (1983), Area Intensive Programme for Educationally Backward Minorities, Modernization

of Madrasa, Maulana Azad Education Foundation Scheme (1989), Free Supply of Books and Stationery and Merit Scholarship, and Pre-examination Coaching scheme for the weaker sections.

Various research studies on Muslim minority conducted after the independence revealed their educational backwardness. But the issue came into lime light after 2001. After the independence, religion wise data were published for first time in the Census 2001and educational backwardness of Muslim community was an eye opener for policy makers and also for implementers. Thereafter many initiatives were taken in favor of the education of the Muslim minority. These include renewal of Prime Minister's 15 point programme in 1983and setting up of Prime Minister's High level Committee on social, economic, and educational status of the

Muslim community[1,2]. In 2004 the National Commission for Minority Educational Institutions (NEMEI) was set up by an ordinance to advise the Centre and state governments on any matter regarding the education of the Muslim minority, to establish and administer educational institutions of their choice. In 2006, National Monitoring Committee for Minority Education (NMCME) was reconstituted with the aim to attend to issues relating to the education of minorities on an ongoing basis. In 2006, the NEMEI"s powers were enhanced by creating an exclusive Ministry of Minority Affairs. In addition, the Ministry plays a pivotal role in planning, coordination and development programs for the benefit of the minority communities.

Recommendations contained in the Report of the High Level Committee on Social, Economic and Educational Status of the Muslim Community of India headed by Justice Rajindar Sachar (Retd.)

1. Need for Transparency, Monitoring and Data Availability - Create a National Data Bank (NDB) where all relevant data for various socio-religious categories are maintained.

2. Enhancing the Legal Basis for Providing Equal Opportunities Set up an Equal Opportunity Commission to look into grievances of deprived groups like minorities.

3. Shared Spaces: Need to Enhance Diversity: The idea of providing certain incentives to a 'diversity index' should be explored.

4. Education: a process of evaluating the content of the school text books needs to be initiated to purge them of explicit and implicit content that may impart inappropriate social values, especially religious intolerance. Need to ensure that all children in the age group 0-14 have access to free and high quality education.

5. High quality Government schools should be set up in all areas of Muslim concentration. Exclusive schools for girls should be set up, particularly for the 9-12 standards. This would facilitate higher participation of Muslim girls in school education. In co-education schools more women teachers need to be appointed.

6. Provide primary education in Urdu in areas where Urdu speaking population is concentrated.

7. Mechanisms to link madarsas with higher secondary school board.

8. Recognize degrees from madarsas for eligibility in Defense Services, Civil Services and Banking examinations.

9. Increase employment share of Muslims, particularly where there is great deal of public dealing.

10. Enhancing Participation in Governance: appropriate state level laws can be enacted to ensure minority representation in local bodies

11. Create a nomination procedure to increase participation of minorities in public bodies.

12. Establish a delimitation procedure that does not reserve constituencies with high minority population for SCs.

13. Enhancing Access to Credit and Government Programmes: Provide financial and other support to initiatives built around occupations where Muslims are concentrated and that have growth potential.

14. Improve participation and share of minorities, particularly Muslims, in business of regular commercial banks

15. Improving Employment Opportunities and Conditions

There are number of schemes and scholarships have been launched by central and state govt. for the welfare of minority education, among that few of

them recognized as most applicable schemes in India like Nai Roshni [4], Nai Manzil, Learn and Earn (Seekho or Kamao) - The scheme will guarantee at least 75 percent employment of trained minority youths and out of them 50 percent will be in the organized sector. A minimum of 30 percent seats are reserved for minority girls and women[5], Jiyo Parsi[5], Free coaching and allied scheme, Pre-Matric Scholarship Scheme[6], Post-Matric Scholarship Scheme[7], Merit-cum-Means Scholarship Scheme[8], Maulana Azad National Fellowship for Minority Students Scheme[9].

NAME AND FUNCTION OF SCHEMES

Government has taken following initiatives for the welfare and up liftmen of the minority communities:-

- USTAAD:- The Scheme aims at upgrading Skills and Training in preservation of traditional Ancestral Arts/Crafts of minorities.
- Hamari Darohar:- The Scheme aims to preserve rich heritage of minority communities in context of Indian culture.
- Khwaza Garib Nawaz Senior Secondary School will be established at Ajmer by Maulana Azad Education Foundation (MAEF) to give a fillip to minority education.
- Nai Manzil: A bridge course to bridge the academic and skill development gaps of the deeni Madrasa pass outs with their mainstream counterparts.
- Strengthening of State Wakf Boards: The scheme envisages providing assistance for meeting the training and administrative cost of State Wakf Boards, removal of encroachment from Waqf Properties and also strengthening of Zonal/Regional offices of Waqf Boards. The government has taken the following steps to ensure that these benefits reach the intended beneficiaries.

- The Scholarship Schemes have been restructured to allow for greater transparency and accountability during processing and sanction.
- To help evaluation of flow of benefits, segregated data for the different minority communities is being sought from all Ministries. The states/UTs have also been requested to provide better and timely feedback.
- The scholarship schemes are reviewed regularly through interaction with the State Governments at regular intervals and field visits by the Ministry officials.
- The Online Scholarship Management System (OSMS) earlier introduced for the Merit-cum-Means scholarship scheme has now been extended to Post Matric scholarship scheme.

1. Nai Roshni

The scheme is envisaged to reach out to women through nongovernmental organizations who will be provided with financial support for conducting leadership development trainings so that women are empowered and emboldened to move out of the confines of home and community and assume leadership roles and assert their rights collectively or individually.

2. Scholarship Schemes

Students belonging to notified minority communities studying in India only and fulfilling the Scheme guidelines are eligible to apply for these scholarships.

(1)Pre-matric Scholarship Scheme for Minorities (for Class I to X) (2)Post-matric cholarship Scheme for Minorities (for Class XI to Ph.D.) (3)Merit-cum-Means Scholarship Scheme (For Professional and Technical courses) (4) Begam Hajrat Mahal National

Scholarship for Meritorious Girls belonging to Minorities-Implemented by Maulana Azad Education Foundation (MAEF) (for minority girls studying in Class XIth and XIIth Standard).

3. Free Coaching & Allied Scheme (for Competitive Examinations of Professional Courses and Government jobs)

- The scheme aims to empower the minority communities by assisting the economically weaker sections of students among them through coaching institutions for enhancing their skills and capabilities to make them employable in industries, services and business sectors in addition to the government sector. It has built-in resilience to adapt to the market dynamics on a continuous basis so that the target groups are not deprived of the professional acumen demanded by the changing/emerging market needs and opportunities for employment at domestic as well as international levels.

Objectives

The objectives of the scheme are to assist students belonging to minority communities by way of special coaching for the following:-

1. Qualifying examinations for admission in technical/professional courses such as engineering, law, medical, management, information technology etc and language/aptitude examinations for seeking admission in foreign universities.

2. Competitive examinations for recruitment to Group 'A', 'B', 'C and 'D' services and other equivalent posts under the Central and State governments including police/security forces, public sector undertakings, Railways, banks, insurance companies as well as autonomous bodies; and

3. Coaching for jobs in the private sector such as in airlines, shipping, information technology (IT), business process outsourcing (BPO) and other IT enabled services, hospitality, tours and travels, maritime, food processing, retail, sales & marketing, bio-technology and other job oriented courses as per the emerging trend of employment.

4. Remedial coaching at undergraduate and post graduate level to improve the academic knowledge and enable the student to catch up with the rest of the class and complete the course successfully.

4. Seekho aur Kamao (Learn & Earn)

Union Ministry of Minority Affairs, Government of India on 23 September 2013 launched a central sector scheme for Skill Development of Minorities

Main Objectives

- To bring down unemployment rate of minorities during 12th Plan period (2012-17).
- To conserve and update traditional skills of minorities and establish their linkages with the market.
- To improve employability of existing workers, school dropouts etc and ensure their placement.
- To generate means of better livelihood for marginalized minorities and bring them in the mainstream.

5. Jiyo Parsi

The Central Sector Scheme for containing population decline of Parsis in India was launched on 23 September 2013 by the Ministry of Minority Affairs, Government of India.

Objectives

The main objective of the Jiyo parsi scheme is to reverse the declining trend of Parsi population by

adopting scientific protocol and structured interventions, stabilize the Parsi population and increase the population of Parsis in India.

Main features

- 100 percent funded by Ministry of Minority Affairs, Government of India.
- Medical interventions under Standard Medical protocols in empanelled hospitals/clinics.
- Confidentiality of the patients to be given utmost importance.

6. Padho Pardesh (for overseas studies at Masters, M.Phil. and Ph.D. Level)

Government of India, Ministry of Minority Affairs has now introduced a new scheme for providing 'interest subsidy' for minority students for overseas studies. This scheme came into force from 2013-14. The loan for overseas studies for specific courses should have been sanctioned by the bank under IBA model scheme. The annual income of the parents should be less than 6 lakhs. If the student is eligible, the Government of India provides full interest subsidy during the moratorium period.

7. Nalanda Scheme

Union Ministry of Minority Affairs has launched the Nalanda Project for Minorities Higher Educational Institutions on 4 March 2014.

Nalanda Project is an innovative Faculty Development Program of Union Ministry of Minority Affairs. The Nalanda Project is being taken up at Aligarh Muslim University, a premier Minority University of world fame. The Aligarh Muslim University is also a Nodal Staff College of University Grant Commission.

About Faculty development program:

- The primary goal of faculty development is to help faculty learn new ways to achieve

excellence and to grow as faculty members. It is an ongoing process of understanding, learning, and growth. Faculty development includes education, collaboration, resources and support.

8.Minority Cyber Gram

The MCG programme seeks to introduce digital literacy skills in identified minority clusters in India through designated Digital Fellows towards knowledge empowerment and entitlement gains of minority focused groups and beneficiaries.

Objectives

- To impart digital literacy and skills among identified minority groups and beneficiaries through designated Digital Fellows (DFs) in identified minority clusters for information and knowledge empowerment and entitlement gains.
- To provide opportunities in information and knowledge networks for local communities.

9.Maulana Azad Sehat scheme

- Under the scheme, Sehat Card will be issued to every student of the Institution financially aided by Maulana Azad Education Foundation (MAEF).
- Preventive Health Check-up Camps will be organized by the Institute twice in a year, through government or private hospitals or nursing homes.
- All findings of the preventive health checkups will be entered in the Sehat Card of the student by the doctors.

10.Computerization of Records of State Wakf Boards

Objectives

As recommended by Joint Parliamentary Committee on Waqf in its 9th Report, the Scheme for "Computerization of records of the State Wakf

Boards" was launched by the Ministry of Minority Affairs, Government of India, to streamline record keeping, introduce transparency, and to computerize the various functions & processes of the Waqf Boards and to develop a single web-based centralized software application. In this Scheme, Central financial assistance is given to the State Waqf Boards for setting-up of ICT Infrastructure, Technical Manpower for initial hand-holding period for managing & operating the ICT infrastructure and software applications, imparting training and knowledge transfer to the State Waqf Boards staff for managing & operating the ICT infrastructure and software applications and data management life cycle during and at the end of hand-holding period.

II. CONCLUSION

The paper revealed that over the years the number of institutions and various schemes have increased; still educational progress of Muslims is not satisfactory in terms of literacy rates, enrolment, and retention and in completion of grades. This also highlighted number of government schemes for the educational development of Muslim minority. Minority community has remained slow in taking advantage of government's educational policies and programs. This is largely because of their cultural ethos resulting slow progress in educational field in comparison with other minorities. This makes it clear that the problems of weak educational development of Muslims need to be understood and treated as per the need and in an area specific manner. That is, strategies for Muslims" educational development should not follow the uniform and blanket approach under one umbrella. Making a policy and implementing it as a scheme has the same difference - what a cricket team plans in a dressing room and what it executes on the ground. The government seems well prepared in the dressing room but when it comes to the ground it falls far from the expectation. There are many schemes if we include both centre and state sponsored programs but despite having so many student-centered schemes, the success rate is not enough.

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A Non isolated Dual input Dual output DC-DC Boost Converter for Electric Vehicle

Toufeeque sheikh[1] , Mohd kamil[1], Sufiyan Ansari[1] , Priti[1], farheen[1], Syed sufiyan[1], Akshay kawale[1] , Asst prof: Akil ahmed[2]

[1]BE Student [UG], Department of EEE, Anjuman College of Engineering & technology, nagpur, Maharashtra, India

[2]Department of EEE, Anjuman collage of Engineering &technology, Nagpur, Maharashtra, India

ABSTRACT

A DC-DC converter is a power electronics device that accepts a DC input voltage and also provides a DC output voltage. The output voltage of DC to DC converter can be greater than the input voltage or vice versa. The converter output voltages are used to match the power supply required to the loads. The connection and disconnection of power supply to the load can be controlled using a switch in the simple DC to DC converter circuit. DC to DC converter circuits consists of a mosfet /IGBT or diode switch, energy storage devices like inductors or capacitors and these converters are generally used as linear voltage regulators or switched mode voltage regulators.

DC to DC Converter Operating Principle and Functionality

To understand the DC to DC converter operating principle and functionality, let us consider the working principle of DC to DC boost converter.

DC to DC Boost Converter

The low input DC voltage is converted into high output DC voltage using DC to DC boost converter. As the input voltage is stepped up compared to output voltage, hence, it is also called as a step up converter. Generally, DC to DC converters can be designed using power semiconductor switching devices and discrete electrical and electronics components.

In DC to DC converter, the converter operates in two modes:

Continuous Conduction Mode

Discontinuous Conduction Mode

Keywords: DC–DC converters, electric vehicle (EV), energy storage system (ESS), fuel cell (FC), hybrid power system, super capacitor (SC).

I. INTRODUCTION

The circuit of the DC to DC boost converter is shown in the figure that consists of an inductor, capacitor, switching device, diode, and input voltage source. This boost converter circuit switch is controlled using a pulse generator. If this switch is in ON state, then

energy will be developed in the inductor and thus more energy will be delivered to the output.

The discontinuous conduction mode circuit of the DC to DC boost converter is shown in the figure that consists of elements such as capacitor, inductor, voltage source, diode, and switching device. In this discontinuous conduction mode, if the switch is in ON state, then energy will be delivered to the power storage element, inductor. If the switch is in OFF state for some period, then the inductor current will reach zero until the next switching cycle is on. Thus, the capacitor gets charged and discharged with respect to the input voltage. But, here the output voltage in discontinuous conduction mode is less than the output voltage in continuous conduction mode.

II. MODIFIED DUAL INPUT DUAL OUTPUT DC-DC CONVERTER WITH PID CONTROLLER.

In a closed-loop system, a controller is used to compare the output of a system with the required condition and convert the error into a control action which is designed to reduce the error and bring the output of the system back to the desired response. Closed-loop control systems have many advantages over open-loop systems. Figure 2 shows block diagram of closed loop system with PID controller.

Open Loop Systems are simpler in their layout and hence are economical and stable too due to their simplicity. Since these are having a simple layout so are easier to construct. These systems do not have a feedback mechanism, so they are very inaccurate in terms of result output and hence they are unreliable too. Due to the absence of a feedback mechanism, they are unable to remove the disturbances occurring from external sources. Closed Loop Systems are more accurate than open loop systems due to their complex construction. They are equally accurate and are not

disturbed in the presence of non-linearities. Since they are composed of a feedback mechanism, they clear out the errors between input and output signals, and hence remain unaffected to the external noise sources. They are relatively more complex in construction and hence it adds up to the cost making it costlier than open loop system. Since it consists of feedback loop, it may create oscillatory response of the system and it also reduces the overall gain of the system. It is less stable than open loop system but this disadvantage can be avoided, since we can make the sensitivity of the system very small so as to make the system as stable as possible.
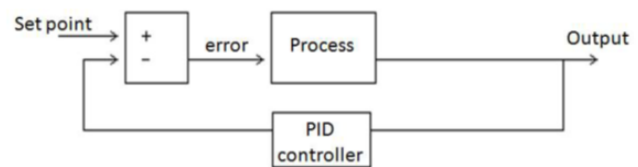
Figure 1

III. RESULTS AND DISCUSSION

For an input of 3 V and 8 V, switching frequency fc as 10kHz and a 100Ω resistive load, the proposed dual input dual output converter was simulated in battery discharging mode by using MATLAB R2014a. Following are the parameters used for MATLAB simulation of the converter.

Tabel 1

Simulation parameters	Values
Switching frequency	10kHz
DC Source (V_{in1})	3 V
Battery (V_{in2})	8 V
Inductor	3.2mH
Capacitors (C_1 , C_2)	22µF
Load resistance	100 Ω

Simulink Model:

Simulink model of a dual input dual output DC-DC Boost converter with PID controller is shown in fig below MOSFET'sare used as switches. Output voltage and output currents are analyzed from the simulation results.
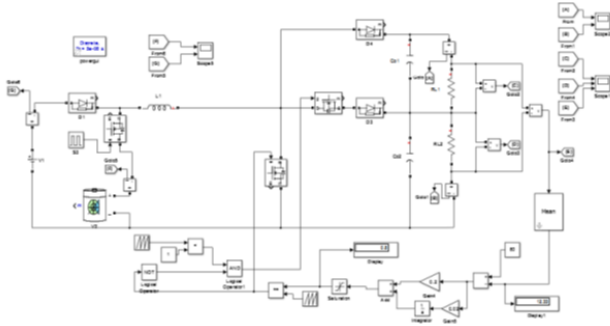
Figure 2

Simulation Results:

Fig. shows the simulation results at the input voltages Vin1 = 3 V and Vin2 (Battery) = 8 V . output voltages thus obtained are VO1 = 3.9 V and VO2 = 8.5 V. Total Voltage VT = 12.4 V
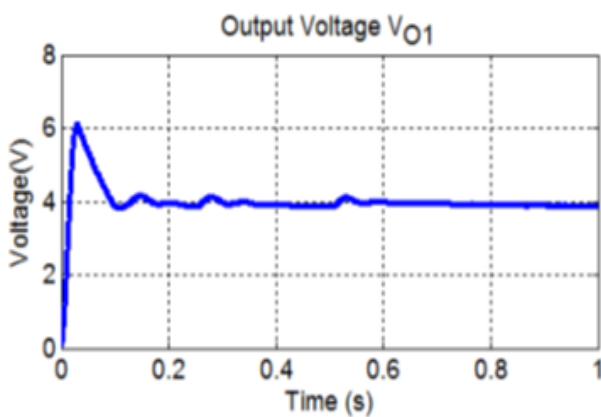
Figure 3
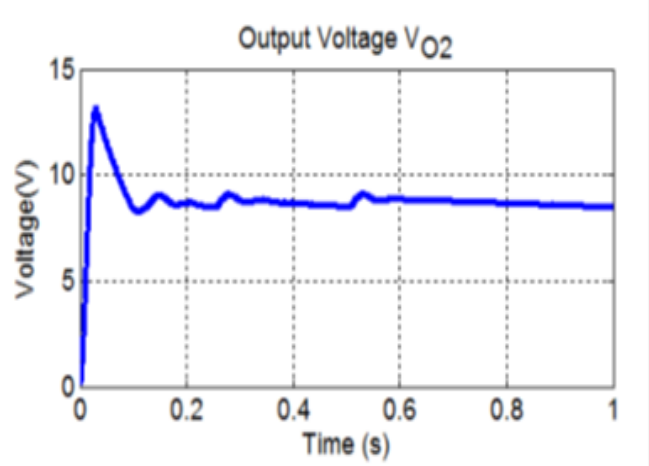
Figure 4

IV. CONCLUSIONS

A new dual input dual output dc - dc boost converter with unified structure for hybridizing of power sources in electric vehicles is presented in this paper. The presented converter has just one inductor. This can be used for transferring energy between different energy resources such as FC, PV, and ESSs like battery and SC. In this paper, FC and battery are considered as power source and ESS, respectively. The converter has two main operation modes in which battery discharging mode both of input sources deliver power to output and in battery charging mode one of the input sources not only supplies loads but also delivers power to the other source (battery). It is seen that under various conditions such as rapid rise of the loads power and sudden change of the battery reference current, output voltages and battery current are regulated to desired values with PID controller. Outputs with different dc voltage levels are appropriate for connection to multilevel inverters. In electric vehicles, using of multilevel inverters leads to torque ripple reduction of induction motors. Also, electric vehicles which use dc motors have at least two different dc voltage levels, one for ventilation system and cabin lightening and other for supplying electric motor. Simulation results verify the operation principle of this converter.

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Moto Hanja Pro

Er. Farheeen Sheikh , Er. Madiha Mahevash , Prof. Nazish Khan

Research student, Department of Computer Science & Engineering, Anjuman College Of Engineering &
Technology, Nagpur, Maharashtra, India

ABSTRACT

The number of personal vehicles usage is increasing manifold. People prefer personal vehicles to commute than depend on public transportation. Finding a parking space in most metropolitan areas, especially during the rush hours, is difficult for drivers. Due to this there is a need to provide sufficient parking places coupled with plenty of slots to help the user park his vehicle safely, also to ensure the user does not end up parking on non-parking area and cause discomfort to pedestrian. The idea behind our Android Application- "MOTO HANJA" (where MOTO means motor or vehicle and HANJA is a Chinese word for parking) is to help the user analyses area's where parking is available and number of slots free in that area. Additionally, to his arrival, the user can book a slot in the area he desires if it is available. This will help reduce the load on the administrator as his physical work reduces drastically and user can search the parking slot through Android Application. "MOTO HANJA" Application relieves the user from the hassle of manually searching and waiting for empty slots to park the vehicle.

I. INTRODUCTION

About Parking:

Parking facilities are a major expense to society and parking conflicts are among the most common problems facing infrastructure planners. These problems can be most often described either in terms of supply or in terms of management. Parking management describes the process of optimizing the use of parking policies while making use of policies and programs that are applicable to parking. A well-thought out parking strategy often helps reduce the number of parking spots required in a particular situation and provides a variety of socio-economic and environmental benefits. When all factors are taken into consideration, improved management is often the best solution to parking problems.

Management solutions tend to be significantly more optimum than increasing supply as they tend to support more strategic objectives. Some of these objectives are listed below.

· Improved user options and quality of service.

· Facility cost savings.

· If the strategies are decided properly, there can be significant revenue generate that could help finance other facilities and improve transportation infrastructure.

Problems with the Parking Industry:

Parking guidance is an optimization control problem which provides driving route suggestion and slot status by using computer technology, mechanics of communication, and control technique for the purpose of guiding drivers to the expected

parking place. The result of such methods is to guide the customer to the expected parking place by driving on planned route. The disadvantage of current smart parking or parking guidance systems is that they only obtain the availability information of parking spots from deployed sensor networks and that they just broadcast the parking information directly to drivers. Since these systems do not actually direct a driver to the designated parking spot they sometimes make the situation worse and are hence deemed not smart enough. It is, therefore, strongly desired to provide an effective strategy to address these concerns.

Environmental Concerns:

Hunting for a vacant parking spot in a metropolitan/suburban area is a daily source of anxiety for most drivers and it is time-consuming. It generally results more traffic congestion and air pollution by constantly cruising in certain area only for an available parking space. For instance, a recent survey, shows that during rush hours in most big cities, the traffic generated by cars searching for parking spots takes up to 40% of the total traffic and a correspondingly high proportion of CO_2 emissions. Motor vehicle accidents and other situations cause high number of fatalities, injuries, and economic distress resulting from emergency and health care services as well as property damage. Parking is a major part of overall mobility as every vehicle trip finally concludes in parking the car somewhere at the destination. Over the course of a year, vehicles looking for parking in one small business district of Los Angeles burned 47,000 gallons of gasoline that totals 945,000 extra miles travelled or two round trips to the moon and produced 730 tons of carbon dioxide. To deal with aimless wandering caused by the search for parking, we have incorporated a reservation system for parking. In this, the user needs to make a reservation and a spot is allocated to him along with directions to that spot.

Parking Space Inefficiency:

Often, people complain of lack of parking spots when actual counts show that only 60 to 75 percent of spots are occupied. It is very important to deal with perceptions of parking shortages. The most appropriate way for cities to address parking shortages is to price the spots that would result in 14 percent of spots being made available. We have provided a 2-class parking strategy involving booking limits where we have a differential pricing of parking spots in order to increase revenue.

II. RESEARCH ELABORATIONS

Existing System

Currently, most of the existing parking system are manually managed and a little inefficient. In urban areas, where number of vehicles is higher as compared to the availability to the parking space, a lot of time being wasted in searching for parking location. Hence smart parking system is a proposed method that user can reserve their parking spaces using our application.

Problem faced by users:

The problem faced by the users in parking their vehicles as indicated by the survey:

1. Long distance from parking to destination.
2. No shades.
3. No proper sign boards and guidance.
4. Security problems.
5. Space congestion.
6. Fuel consumption is high.
7. Wastage of time in search of parking space.

III. RESULTS

The user needs to install the "MOTO HANJA" application on his Android based device. After installation, the icon of the app will feature on the Home Screen of the user's device. "MOTO HANJA" welcome screen will be flashed to the user on opening the application. Initially, the user has to register his details with the application for the first time. This is a one-time registration. The user allotting parking area has to enter details like username, phone number, address, vehicle type, parking fees and email-id. All this data will be stored on server.

IV. CONCLUSION

As compared to other developed countries, the problem of parking is disheartening in India as there is no well devised plan in place. There is a wide gap and total mismatch between the production of vehicles and the parking slots. Government authorities have been raking their brains day in and day out to tackle this problem. The parking problem is quite acute in places of entertainment such as theatres and shopping malls. We touched a small scenario of parking problem in India.

We brought out in this paper how the parking problem in such places can be tackled with a well-thought plan. The plan helps both the visitors and administrators. It helps the visitors in finding out the availability of a parking slot, get the availability confirmed, and reach the place within the time slot allotted. It helps the administration to allocate the vacant slot to the next person in queue. A well thought parking plan saves the time of visitors in booking a parking slot in advance and the administration to allocate the vacant slot in a methodical and organized manner.

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"A Review on Self Cured Concrete"

Mohammad Samar Khan[1] , Syed Shahnawaz[1] , Moin Sheikh[1] , Mohammad Shahid Arshad[2]
[1]UG Student, Civil Engg. Department, ACET, Nagpur, Maharashtra, India
[2]Assistant Professor, Civil Engg. Department, ACET, Nagpur, Maharashtra, India

ABSTRACT

The imagination of a world without concrete is impossible. Concrete is a soul of infrastructures. Concrete is necessary to gain strength in structures. Conventional concrete is a mixture of cement, fine aggregate, coarse aggregate and water needs curing to achieve strength. It is required to cure for a minimum duration of 28 days for good hydration & to achieve target mean strength. Lack of water curing can badly affect the strength & durability. Self curing concrete is one type of modern concrete, which cure itself by retaining water in it. For the same an admixture called Poly Ethylene Glycol (PEG) used as a self curing admixture. Many researchers used PEG by taking into account preparation & analysis of self curing concrete is done. Effect of admixture on compressive strength of M25 & M30 mix for 7, 14 & 28 days is analysed. This paper presents a review of all such authors who had used PEG in various forms for to determine its optimum doses and its various properties. Also its effect on the structures like permeability, porosity, corrosiveness and moisture content are checked.
Keywords: Poly Ethylene Glycol (PEG), Self-curing concrete (SCC), Normal curing concrete (NCC), Compressive strength.

I. INTRODUCTION

"Concrete is a pourable mix of cement, water, sand and gravel that hardens into a super strong building material. Sidewalks, foundation and highways are all made of concrete."

Curing is the process of maintaining satisfactory moisture content and temperature in freshly cast concrete for a definite period of time. In simple language it is the process of pouring water on concrete after initial settling of concrete.

Curing of concrete plays a major role in developing the strength and hardness of concrete, which leads to its improvement in durability and performance.

Proper curing of concrete structures is important to meet the performance and durability requirements. In conventional curing this is achieved by external curing applied after mixing, placing and finishing. Self-curing or internal curing is a technique that can be used to provide additional moisture in concrete for more effective hydration of cement and reduced self-desiccation.

Currently, there are two major methods available for internal curing of concrete. The first method uses saturated porous lightweight aggregate (LWA) in order to supply an internal source of water, which can replace the water consumed by chemical shrinkage during cement hydration. The second method uses poly-ethylene glycol (PEG) which

reduces the evaporation of water from the surface of concrete and also helps in water retention.

Self-curing refers to the process by which the hydration of cement occurs because of availability of additional internal water that is not a part of mixing water, that is curing is taken to happen from inside to outside. Internal curing distributes extra water throughout the entire microstructure, thus maintaining saturation of the cement paste during hydration. There are two major methods available for internal curing of concrete. The first method uses saturated porous lightweight aggregate in order to supply an internal source of water which can replace the water consumed by chemical shrinkage during cement hydration. These saturated porous lightweight aggregate stores water in it and act as reservoirs which will be able to release the water whenever the concrete requires. The second method uses poly-ethylene glycol which reduces the evaporation of water from the surface of concrete and also helps in water retention.
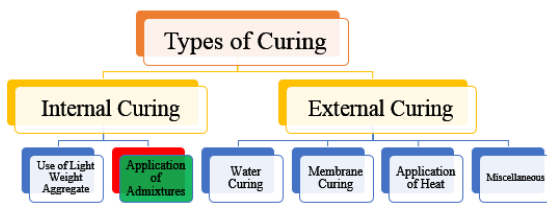
Figure 1. Types of Curing

II. LITERATURE REVIEW

1.**Mohammed ShafeequeSanofar.P.B, Praveen.K.P., Jitin Raj, Nikhil.V.P, Gopikrishna(2016)** has used PEG600 as a self-curing agent in concrete. M20 and M25grade of concrete are adopted for investigation. They added 0-2% of PEG600 by weight of cement for M20 and M25 grade concrete. From that they found 1% of PEG600 by weight of cement was optimum for M20 and M25 grade of concrete for achieve maximum strength.[1]

2. **Basil M Joseph(2016)** Studied on self-curing concrete and PEG400 were used as a self-curing agent in concrete. M20 grade of concrete is adopted for investigation. He added 0-1.5% of PEG400 by weight of cement for M20 grade concrete from that he found 1% of PEG400 by weight of cement was optimum for M20 grade of concrete for achieve maximum strength. He also found that if percentage of PEG400 gets increased slump as well as compaction factor also increased[8]

3. **ShikhaTyagi (September2015)** Used polyethylene glycol as shrinkage reducing admixtures as a internal curing compound. This compound when added to concrete result in self curing and better hydration and good compressive strength. Traps the moisture within structure and hence water is available for hydration .The effect of curing compound on workability and compressive strength is studied.[2]

4. **Wen-Chen Jau(2014)** stated that self-curing concrete is provided to absorb water from moisture and from air to achieve better hydration of cement in concrete. It reduces the problem when the degree of cement hydration is lowered due to no curing or improper curing by using poly-acrylic acid as a self-curing agent which has strong capability of absorbing moisture from atmosphere and providing water required for curing concrete.[3]

5. **Stella Evangeline(2014)** had use poly vinyl alcohol as self-curing agent in concrete. He added 0.03-0.48% by weight of cement from that he found 0.48% of poly vinyl alcohol by weight of cement provides higher compressive, tensile as well as flexural strength than the strengths of conventional mix.[4]

6. **DayalanJ(2014)** had used super absorbent polymers as a self-curing agent in concrete. He was added 0.0-0.48% of super absorbent polymer by

weight of cement for M25 grade concrete. He was found that super absorbent polymer 0.48% by the weight of cement provides higher compressive, tensile as well as flexural strength than the strength of conventional mix.[5]

7. Patel Manish Kumar Dahyabhai& professor Jayesh Kumar Pitroda(2013)studied on "introducing the self-curing concrete in construction industry". Compressive strength of self-curing concrete is increased by applying self-curing admixtures. The compressive strength of concrete mix increased by 37% by adding 1.0% of PEG600 and 33.9by adding 1.0% of PEG1500 as compared to the conventional concrete. The optimum dosage of PEG600 for maximum compressive strength was found to be 1% of weight of cement for M25 grade of concrete. The optimum dosage of PEG1500 of maximum compressive strength was found to be 1% of weight of cement for M25 grade of concrete. Self-curing concrete is the best solution to the problem faced in the desert region and faced due to lack of proper curing.[6]

8. A.S. EL-Dieb et al. (2013) Investigated water retention for the concrete mixes.Self curing suffered less self desiccation (dryingness) under sealed condition compare to conventional concrete. S.C.C resulted in better hydration with time under drying condition compared to conventional concrete. Water sorptivity and water permeability values for self curing concrete decreased with age indicating lower permeable pores percentage as a result of the continuation of the cement hydration.[7]

9. PietroLura(2003) The main aim of his study was to reach a better comprehension of autogenous shrinkage in order to be able to model it and possibly reduce it. Once the important role of self-desiccation shrinkage in autogenous shrinkage is shown, the benefits of avoiding self-desiccation through internal curing become apparent.

10. Roland Tak Yong Liang, Robert Keith Sun(2002) carried work on internal curing composition for concrete which includes a glycol and a wax. The invention provides for the first time an internal curing composition which, when added to concrete or other cementitious mixes meets the required standards of curing as per Australian Standard AS 3799.[10]

Table 1

Year	Author	Experiment Conducted	Material Used/ Admixture	Grade	Findings
2016	Mohammed Shafeeque Sanofar.P.B, Praveen K.P., Jitin Raj, Nikhil V.P, Gopikrishna	Used PEG600 as a self-curing agent in concrete.	PEG-600	M20 and M25grade	1% of PEG600 by weight of cement was optimum for M20 and M25 grade of concrete for achieve maximum strength.
2016	Basil M Joseph	Studied on self-curing concrete and PEG400 were used as a self-curing agent in	PEG-400	M20	found that if percentage of PEG400 gets increased slump as well as compaction factor also increased.

Year	Author	Title	Material	Grade	Conclusion
		concrete.			
2015	ShikhaTyagi	Effect of curing compound on workability and compressive strength.	Poly ethylene glycol (PEG)	–	PEG added to concrete result in self curing and better hydration and good compressive strength.
2014	Wen-Chen Jau	Self-curing concrete is provided to absorb water from moisture and from air to achieve better hydration of cement in concrete.	Poly-acrylic acid as a self-curing agent	–	Moisture from atmosphere and providing water required for curing concrete. It reduces the problem when the degree of cement hydration is lowered due to no curing or improper curing by using poly-acrylic acid as a self-curing agent which has strong capability of absorbing.
2014	Stella Evangeline	Use poly vinyl alcohol as self-curing agent in concrete.	Poly vinyl alcohol as self-curing agent		0.48% of poly vinyl alcohol by weight of cement provides higher compressive, tensile as well as flexural strength than the strengths of conventional mix.
2014	Dayalan J.	Used super absorbent polymers as a self-curing agent in concrete.	Super absorbent polymer	M25 grade	Super absorbent polymer 0.48% by the weight of cement provides higher compressive, tensile as well as flexural strength than the strength of conventional mix.
2013	Patel Manish Kumar Dahyabhai & Prof. Jayesh Kumar Pitroda	Study of various % of PEG in M	PEG-600, PEG-1500	M25 grade & M20	Water transport (water evaporation) self curing concrete is lower than air conventional concrete. Water sorption water permeability values for self curing decreased with age.
2013	A.S. EL-Dieb et al	Water retention for the concrete mixes.	-	–	Water sorptivity and water permeability values for self curing concrete decreased with age indicating lower permeable pores percentage as a result of the continuation of the cement hydration.

2003	Pietrol Lura	Study was to reach a better comprehension of autogenous shrinkage in order to be able to model it and possibly reduce			The important role of self-desiccation shrinkage in autogenous shrinkage is shown, the benefits of avoiding self-desiccation through internal curing become apparent.
2002	Roland Tak Yong Liang, Robert Keith Sun	Work on internal curing composition for concrete which includes a glycol and a wax.	Glycol and a wax	_	The invention provides for the first time an internal curing composition which, when added to concrete or other cementitious mixes meets the required standards of curing as per Australian Standard AS 3799.

III. CONCLUSION

Based on literature review, following conclusions are obtained:

- ✓ The optimum dosage of PEG400 for maximum strength (compressive, tensile and modulus of rupture) was found to be 1% for the M20.
- ✓ As percentage of PEG400 increased slump increased for M20 grade of concrete.
- ✓ Strength of self-curing concrete is on par with conventional concrete.
- ✓ Self-curing concrete is the answer to many problems faced due to lack of proper curing.
- ✓ Self-curing concrete is an alternative to conventional concrete in desert regions where scarcity of water is a major problem.

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"Synthesis ,characterization and Pharmacological activities of 7-substituted Imino-phenothiazine-2-methyl-4-Quinolones"

Tasneem K. H. Khan[1], M.N. Narule[2], M. D. Choudhari[3]
[1]Chemistry , Rtmnu, ACET , Nagpur, Maharashtra, India
[2]Chemistry, Rtmnu, VVACSC, Samudrapur , Maharashtra, India
[3]Chemistry , Rtmnu, BDCOE , Wardha, Maharashtra, India

ABSTRACT

The pharmacological activities related to phenothiazine, with an account on the synthesis of 7-substituted imino-phenothiazine- 2-methyl-4-quinolones 1 (Scheme 1) and their related compounds. The structure of the synthesized compound was predicted by elemental analysis, IR spectroscopy, 1H NMR, C13 NMR and Mass spectra, successfully confirming the prepared derivatives
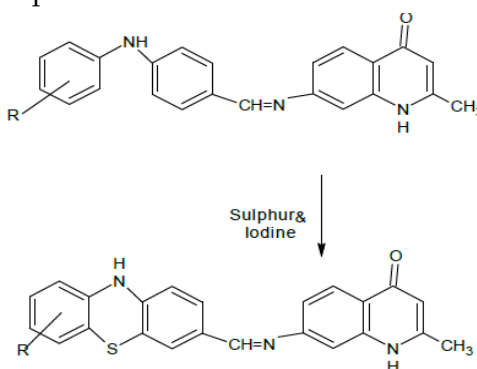
Scheme 1

R= 4-Cl; 4-OCH₃;2-OH; 4-OH;2,4-Di-NO₂; 2,4-Di-Cl;2,4-Di-NH₂;H;2-Cl;

2-OCH₃; 2-CH₃;4-CH₃; 2-NO₂; 4-NO₂; 2-Br;4-Br;2-NH₂;2-N(CH₃)₂;

4-N(CH₃)₂;2-N(CH₃)₃; 4-N(CH₃)₃

Keywords: Heterocyclic, Quinolones, phenothiazines

I. INTRODUCTION

Heterocyclic compounds have played a significant role in the evolution of life, as dyes, drugs and are also used in many commercially important agrochemicals and veterinary species. Quinolones are very important family of synthetic broad spectrum antibiotic drugs and inhibit the enzymes topoisomerase II, a DNA gyrase responsible for the replication of microorganisms. They acts as anticancer, antimalarial, antiviral and antibacterial agents. Quinolones and their derivatives exhibit effectiveness in the treatment of prostatitis due to its excellent penetration into prostatic tissue, as a

secondline drug to treat tuberculosis. Quinolones are also used clinically in the treatment of respiratory tract infections (RTIs), sexually transmitted Infections (STIs), anthrax, Travellers' diarrhoea, diabetic foot infections, paratyphoid fever, corneal ulcers and superficial eye infections. The quinolones generally have greatest activity against Gram negative bacteria, with the most susceptible organisms including members of Enterobacteriaceae, Neisseria species and Haemophilus species.

Phenothiazine derivatives possess diverse biological activities like antiviral, anthelmintic, anthihistaminic, anticonvulsant, antiperkinsonian, antiparasitic, antiemetic, anticholinergic, antimalarial, insecticide and CNS depressant. It is a group of tranquilizing drug with antipsychotic actions. Phenothiazines are used to treat psychosis or schizophrenia. In the view of these observations, it was thought worthwhile to synthesize several compounds in which ethylacetoacetate, different derivatives of aniline and quinolones have been linked with each other to form a new Quinolones derivatives and biological evaluation of these synthesized compound.

Heterocyclic compounds occur vary widely in nature and essential to life. Nitrogen containing heterocyclic molecules constitutes the largest portion of chemical entities, which are part of many natural products, fine chemicals and biologically active pharmaceuticals vital for enhancing quality of life. A slight change in the substitution pattern of phenothiazine nucleus brings a marked difference in their biological activities. So it has been considered worthwhile to synthesize phenothiazine incorporated heterocyclic compounds as antimicrobial agents. Phenothiazine derivatives showed a wide range of different types of biological activity such as Antihelmatic activity1-9, Bactericidal activity 10-14, Antiseptic activity 15-17, Antitumor activity, Ant cholinergic activity, Anticonvulsant activity ,Antihistamine activity, Narcobiotic activity , Analgesic activity, Antiemeticactivity, Anti-inflammatory activity, Hypnotic activity, Antispherocytic activity, Ant psychotropic activity, Antispasmodics activity, Localanesthetic activit, Antitumor activity, Sedative activity , Antimalarial activity, Antituber activity.

II. EXPERIMENTATION

7-Substituted Imino-Phenothiazine-2-Methyl-4-Quinolones (1) were synthesised from N-(2-methyl -4-quinolone)Azomethine-4-aminophenyl. A mixture of substituted N-(2-methyl -4-quinolone) Azomethine-4-aminophenyl 3a (0.05 mole) in presence of sulphur and iodine was reacted. The resulting mixture was allowed to stand for 1 h keeping the internal temperature between 5-10⁰C. The mixture was refluxed for 3 h. The solvent was removed under vacuum to obtain the crude product which was washed with water followed by ethanol (10 mL) and crystallized from appropriate solvents (70% aqueous ethanol), resulting in compound 1 (a-u). The reported melting point 206⁰C and yield 71%. Similarly other 7-substituted imino Phenothiazine -2-methyl -4-Quinolones were prepared.
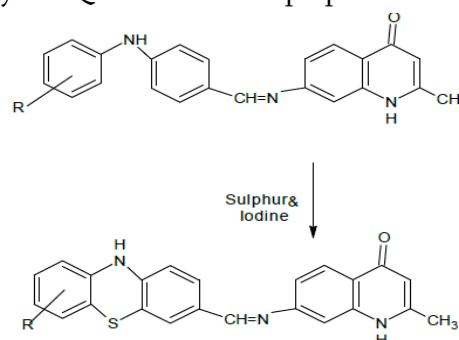
Figure 1

III. CONCLUSION

Characteristization of product 1

Solubility: The product is yellowish brown crystalline solid, soluble in benzene and in soluble in water. It gave positive test for nitrogen **,** sulphur. The product gave satisfactory C,H and N elemental analysis

FT-IR: The Infrared spectrum showed characteristics absorption band at Vmax cm-1: 3477.0(NH), 3348(NH), 2362.4(C-S-C), 1804.9 (CH=N), 1622.8 (C=O), 2980.4 (CH3) and 1507.6 (Ar). (Figure 1)

1H NMR : The NMR Spectrum displayed signals at 10.67 (1H, s, OH), 7.88 (1H, s, NH), 7.83 (1H, s, NH), 7.60 (3H, s, 3x CH), 7.42 (2H, s, CH2), 6.35 (4H, s, Ar)

C13 NMR: The C13 NMR spectrum of the product showed signal at δc 150.09, 149.06, 146.33, 145.85, 144.60, 143.20, 119.38, 116.26, 112.56, 112.14, 78.96, 78.54, 78.10 and 40.434 and 40.05

FAB MS: Mass fragmentation is shown on 383 [M+], 226(C13H10N2S), 198(C12H8NS), 78(C6H6), 125(C6H7NS), 159(C10H9ON), 85(C4H7ON), 78(C6H6).The molecular ion peak was found at 383, which confirmed the molecular formula C23H17ON3S. (Figure 3) On the basis of the above solubility, elemental, functional group and spectral analysis the product was assigned to be **7-Substituted Imino-Phenothiazine-2-Methyl-4-Quinolones** having molecular formula C23H17ON3S
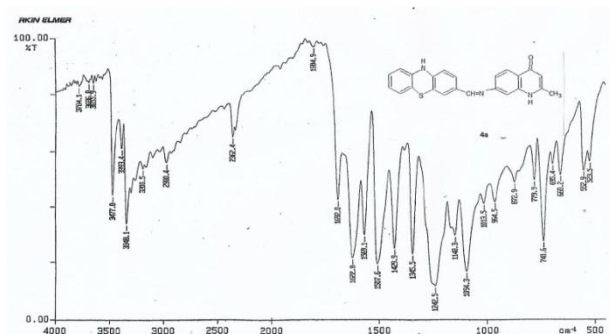
Figure 2. FT-IR of compound 1
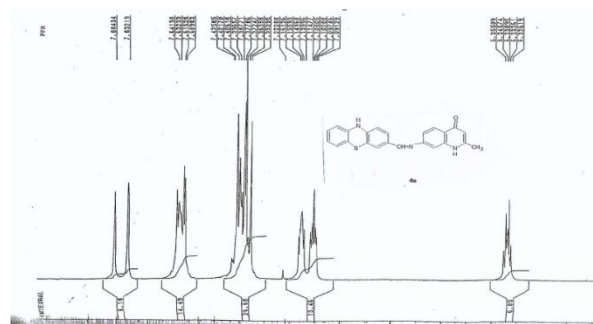
Figure 3. 1H NMR compound 1
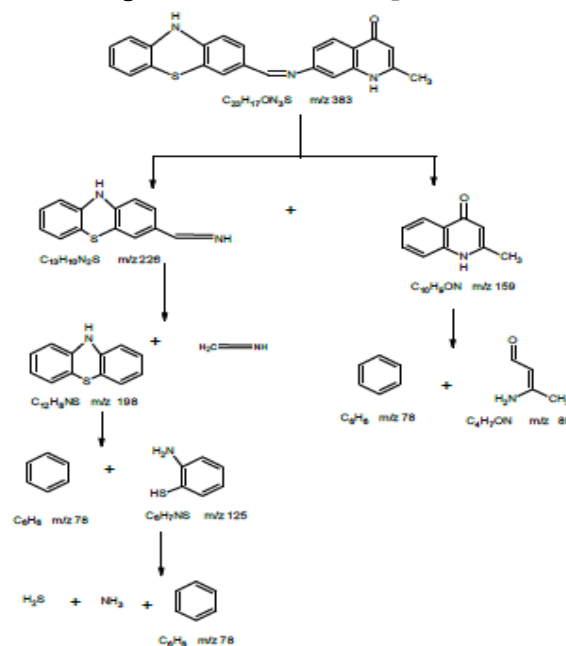
Figure 3. Mass fragmentation

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Single to Mlticloud Security (By Parts)

Harshal S. Wankar, Gaurav Jasutkar, Arati Chipate

Anjuman College Of Engineering And Technology, Department of Computer Science and Engineering, Sadar
Nagpur , Maharashtra, India

ABSTRACT

Cloud computing is largely viewing technology in software industries. It is adopted as service program, where users can remotely depot their data into the cloud so as to take advantage of on-demand high quality services from a shared set of manageable computer devices. Cloud computing offers large benefits to its users, But it also remain with a set of problems and unpredicted decision which security is the biggest concern. Now days cloud computing is very beneficial to its user for shearing a data with other without threating by unwanted user access. To access the security level on cloud storing data partition of data is done. The partition of data is not the final storage in cloud it just a middle step of process. The parts of data is get encrypted with secret shearing schema are used to restrict the unwanted access to the restricted data. The secret shearing schema is also get upgraded by adding Shamir's secret shearing concept in it. Threshold secret sharing schema in which all the participants are needed in reconstruction phase this is required for reconstruct the secret. With these in feature easy data outsourcing with the help third party storage service providers. It has a considerable potential as similar process for traditional silo computing. The Shamir's secret shearing schema is help to store the parted data in the different cloud with proper rearrangement method with it. The threated data from one cloud get corrupted or loss but the original data can be recover with other clouds data. Data encryption, threshold secret shearing schema, Shamir's secret shearing algorithm is the mainly used for the securing data outsourcing. In this paper Shamir's secret shearing schema with the utilization of partition of data is used in multi cloud environment.

I. INTRODUCTION

The main goal of this project is to increase the security of cloud database for cloud computing community with third party utilization. These kind of security is achieved by implementing Shamir's secret shearing algorithm with the addition concept of data partition before algorithm performance. The data parts get separate implementation of Shamir's secret shearing algorithm which again get divided into parts on the bases of Shamir's algorithm. The Shamir's use data encryption for better security by making the double time divided data into the unreadable format. In this system the encrypted data get stored into the different cloud for higher security provision. It can improve the performance with fast processing of data in clouds. It get better in MULTI – CLOUD environment.

- Better performance
- Fast data Service

- Increase
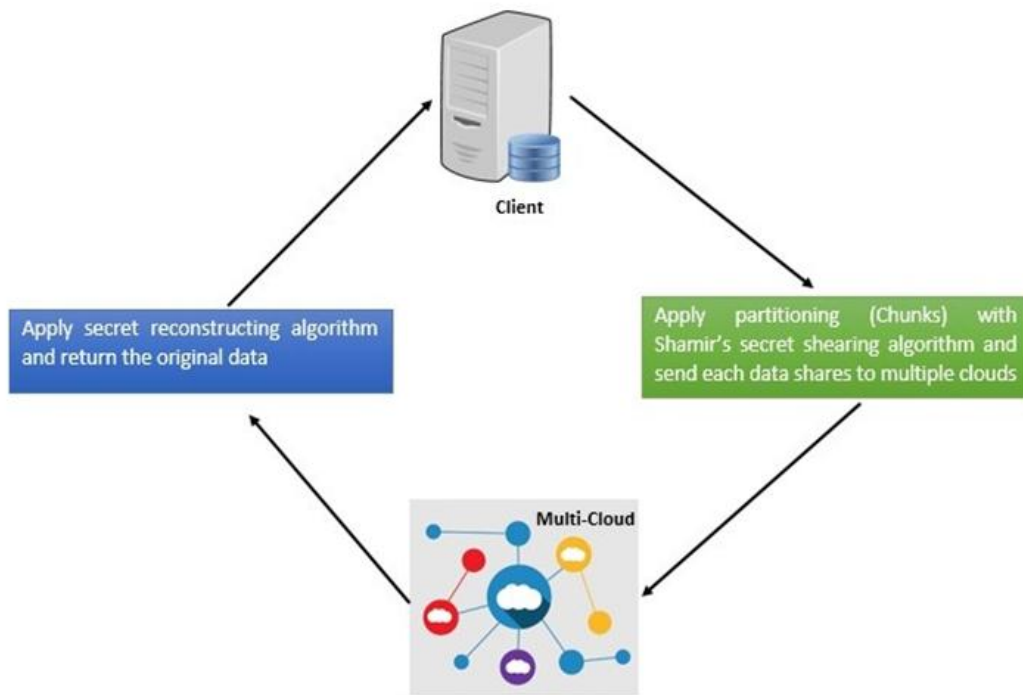
Figure 1. Block Diagram of Secret Shearing algorithm
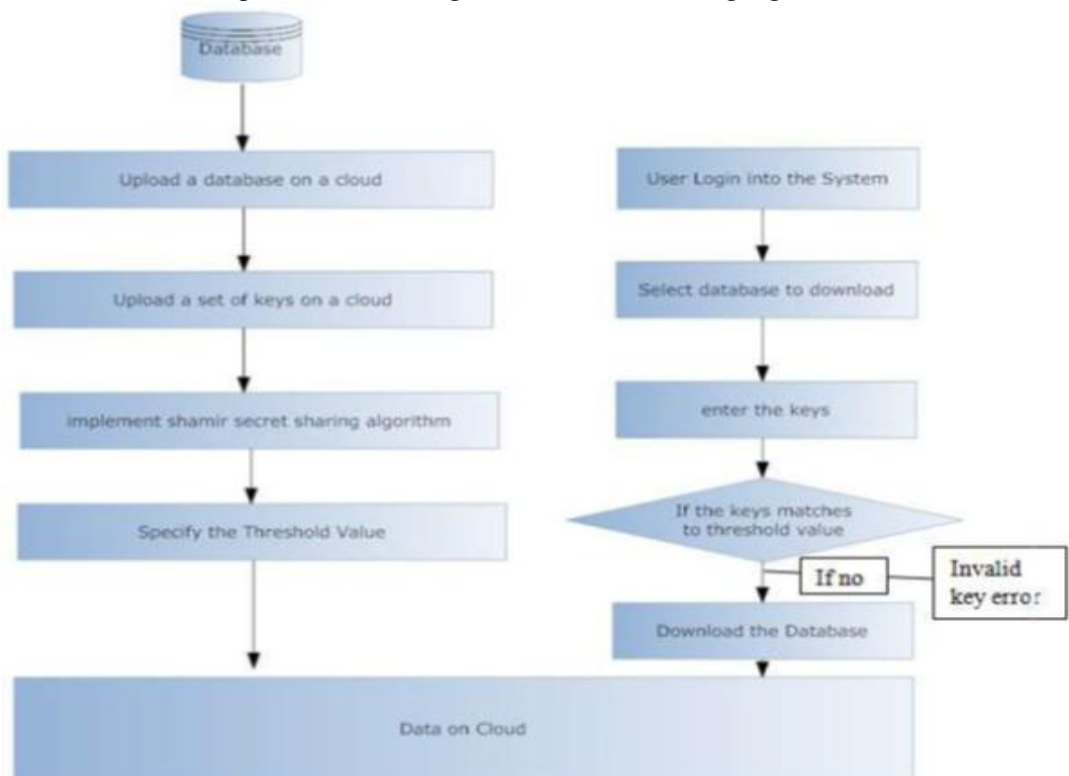
Figure 2. Architecture Design

II. MULTI-CLOUD

Multi-Cloud is a collection of several clouds. In a single cloud infrastructure if the data in single cloud get corrupted then there is a loss of data is occur. Multi-Cloud environment solve this problem by containing the data in multiple cloud if one cloud data is get corrupted then it can be recover from the other clouds. The replication of data in multiple clouds can save the loss of data fact. So when one cloud get attack by the threat then it data can be save with its replication in other cloud.

2.1 CLOUD SERVICE MODELS

- **IAAS –** Infrastructure as a service should fulfill the essential characteristics to support cloud services. It is built using a shared pool of computing resources, such as virtual compute, virtual storage, operating systems and virtual network.
- **PAAS –** Platform as a service is within IAAS. Within the PaaS model, customer's area unit supplied with associate degree package, artificial language execution setting, database, and internet server. They're not concern with the price and management within the hardware and package layers. PaaS is that the use of cloud computing to supply platforms for the event and use of custom applications. The PaaS solutions embody application style and development tools, application testing, versioning, integration, readying and hosting, state management, and different connected development tools.
- **SAAS -** Software-as-a-Service could be a computer code distribution model during which applications are hosted by a vender or

service supplier and created accessible to customers over a network, usually the net.

III. SHAMIR'S SECRET SHEARING ALGORITHM

The Shamir's secret shearing algorithm is divide the data into the parts and after that it encrypt the data. Stored the encrypted data into the multiple clouds.

3.1 MATHEMATICAL DEFINITION

The goal of the algorithm is to divide the data DATA into n pieces (PART1, PART2, PART3, PART4 ….. PARTn) so that,

1. Retrieving any k or more PARTi pieces makes PART easily computable.

2. Retrieving any k-1 or fewer PARTi pieces leaves PART thoroughly undetermined.

The above scheme is known as threshold (k, n). If k=n, then all pieces are available for reconstruction of DATA. The objective of Adi Shamir's secret sharing algorithm algorithm is that, k points are enough to define a polynomial of degree k-1.

 Example, 2 points are sufficient to define a line.

Choose an approximate k-1 coefficients c0, c1, c2, c3….ck-1 in H, and let c0 = S, where S is the Secret data which is going to be stored in cloud. Build the polynomial H(z) = c0 + c1z1 + c2 z2+……+ck-1zk-1. Then n points are defined, for example set i=1,2….n to retrieve (i, H(i)) . A pair is formed with input to the polynomial and output.

Given any subset of k of these pairs, using interpolation the coefficients of the polynomial can be found and the constant term a0 is the secret.

SHAMIR'S APPROACH

The secret is divided into pieces by considering an approximate degree polynomial

$H(z) = c_0 + c_1 z_1 + c_2 z_2 + \ldots + c_{k-1} z_{k-1}$

In which $c_0 = S$, $S_1 = H(1)$, $S_2 = H(2), \ldots, S_n = H(n)$ and represent each share as a point

$(z_i, G(z_i) = y_i)$

IV. TECHNOOGY

HARDWARE REQUIREMENT

1. Processor   - Pentium-iii
2. Speed   - 1.1GHz
3. RAM   - 256 MB(min)
4. Hard Disk   - 20 GB
5. Keyboard   - standard keyboard

SOFTWARE REQUIREMENT

✓ Operating system – windows xp
✓ Front end – HTML,JAVA,JSP
✓ Script – java script
✓ Database – MYSQL
✓ Ellipse - Oxygen

V. CONCLUSION

- This study is carried out to design single and multi-cloud using secret key sharing algorithm which will result in deduction of the cost for the physical infrastructure, reducing the cost entry and execution as well as the response time for various associated applications.

- Also the disadvantages of single cloud and advantages of multi-cloud were addressed in this paper.
- Customer do not want to lose their private information as a result of malicious insiders in the cloud.

Wireless Energy Meter Monitoring System with Automatic Tariff Calculation Using Zigbee and GSM Module

Dr. S.R. Kalambe, Ichchha Nannaware, Damini Shingne, Hitesh Dharme, Nitin Gaikwad, Sameer Kawade

Department of Electrical Engineering, Dr. Babasaheb Ambedkar College Of Engineering And Research,
Nagpur, Maharashtra, India

ABSTRACT

The purpose of this project is to remote monitoring and control of the digital energy meter. This system enables the electricity department to read the meter readings regularly without the person visiting each house. In this, aurdino UNO is used for manage energy data and Zigbee module is a wireless protocol which is used to enable communication between the energy meter and electricity board. Real time data will show on LCD which is connected near to energy meter. GSM (Global System Mobile) is also use for sending the billing information on consumer's mobile.

keywords: Energy meter, Aurdino UNO, Zigbee, GSM.

I. INTRODUCTION

With the passage of time, technology has merged itself with the daily life of humans. We have seen so much progress in the field of science and technology but we are not able to make full use of it. One such area for improvement is the electricity board billing system. Our existing electricity board billing system in India is absolute and time consuming. We are proposing a system through which electricity billing becomes fully automated and communication is made possible via. GSM networks. In EB meters there are two types, Analog meters and digital meters. The analog meters were mostly used in olden days. These meter readings are calculated under the basis of the number of rotation made by the rotating disc. The digitl meter is the mostly used EB meters now a day. This meter works on the basis of the flash made by the LED and according to that the reading are calculated.

The EB meter present in each house is connected by wireless network through a GSM modem with the EB office and also the home user is provided with a Zigbee network in which one Zigbee is connected to the home user personal computer for timely viewing of the reading consumed by his household and also provides a provision of knowing the individual energy consumption by each device used in our homes. The design of a simple low cost wireless GSM and Zigbee based energy meter and its associated interface, for automating billing and managing the collected data globally. The block diagram of consumer side is shown in Figure 1.

This system replaces traditional meter reading methods and enables remote access of existing

energy meter by the energy provider. Also they can monitor the meter readings regularly without the person visiting each house. A GSM and Zigbee based wireless communication modules are integrated with electronic energy meter of each entity to have remote access over the usage of electricity. A PC with a Zigbee receiver at the other end, which contains the database acts as the home section point where the domestic user can have a track of how much amount of energy is consumed. This consumed units are transfer to the EB (Electricity Board side fig.2) side with the help of Zigbee transmitter and EB side Zigbee receiver receive the consume units. Then with the help of GSM technology we able to send SMS to consumer. In SMS thier is information regarding billing of number of units consumed by the consumer.

BLOCK DIAGRAM:
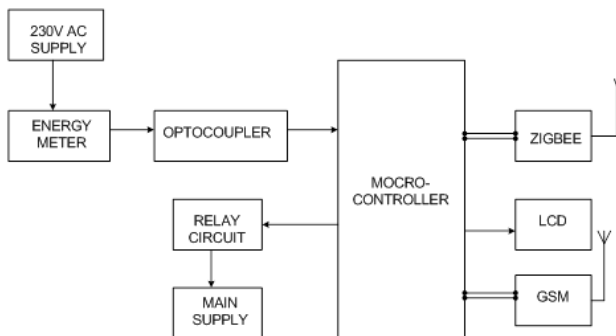
Figuer 1. Block Diagram Consumer side
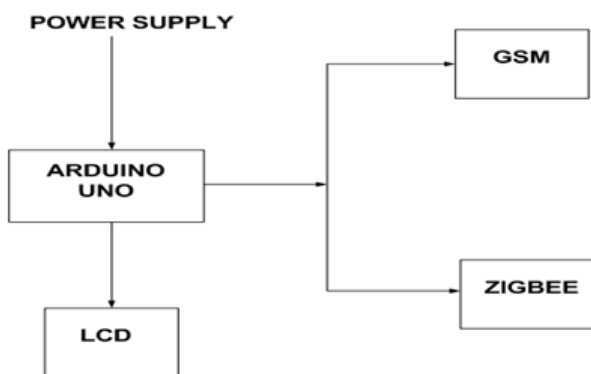
Figure 2. Block Diagram Consumer Side

Energy Meter: An electricity meter is a device which measures the total electrical energy (or electricity) consumed by the appliances which draw electrical energy from the main power supply at a house or an official space and so on. Electricity meters are a common sight in the households today. When we look at meter, we see a few digits on it. These digits (reading on the meter) tell us how many units of electricity (mentioned as kWh in the meter) have you consumed so far. And electricity bill is entirely dependent on this meter. The reading of the meter is cumulative. So to determine consumption reading of a particular month, the difference between the readings of that month and the previous month is calculated.

Types of electricity meter:

1. Electromechanical meter
2. Electrostatic meter

1.Electromechanical meter: Electromechanical meter were very common in India few years ago. They still are very popular in the rural areas where the penetration of the
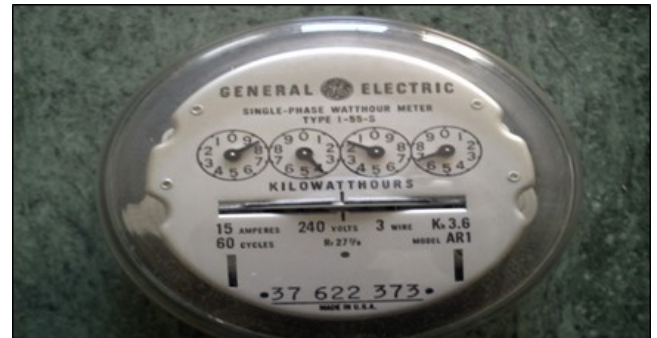
Figure 3. Electromechanical Meter

modern technology is not as high as it is in the urban areas. The working of electromechanical meters is fairly simple and it is shown in Fig.3. There is a non-magnetic metallic disc attached to it internally which rotates depending upon the power passing through it. So if the power passing through is high, then the disc is rotates faster and when the

passage of the power is low, the disc rotates slower. The rate of the rotation in turn decides the reading on the electricity meter. Higher the number of rotation, higher is the reading and vice-versa. Since there is rotation of a disc involved, it is bounded to consume some electrical energy itself to facilitate the rotations. The power of around 2watts is consumed to make it rotate and this power consumption is not registered on the meter.

2. Electronic meter: Electronic meter are becoming increasingly popular now-a-days in urban areas. An electronic meter has a LED/LCD display on which the readings of the connected appliances. The readings are digital in the electronic meters in contrast to the electromechanical meters. This meter shown in Fig.4 These are much more efficient than the electromechanical meters in the sense that they do register every small unit of electricity consumed.

Figure 4. Electrostatic Meter

RELAY:

Relay is an electromagnetic device which is used to isolate circuit electrically and connect them magnetically. Relay shown in Fig.5. They are very useful device and allow one circuit to switch another one while they are completely separate. They are often used to interface and electronic circuit (working at low voltage) to an electrical circuit which works at very high voltage.
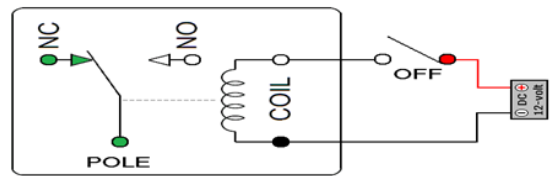
Figure 5. Relay

A relay switch can be divided into to parts: input and output. The input section has a coil which generates magnetic field when a small voltage from an electronic circuit is applied to it. This voltage is called the operating voltage. Commonly used relays are available in different configuration of operating voltages like 6V, 9V, 12V, 24V, etc.

The output section consist of contactors which connect or disconnect mechanically in a basic relay there are three contactors: Normally open(NO), Normally closed(NC) and Common(COM). At a NO input state the COM is connected to NC. When the operating voltage is applied the relay the relay coil is energized and the COM changes contact to NO.

OPTOCOUPLER:

"In electronics, an opto-isolator, also called an optocoupler, Photocoulper or optical isolator, is a component that transfers electrical signals between two isolated circuits by using lights. Opto-isolators prevent high voltages from affecting the system receiving the signal."
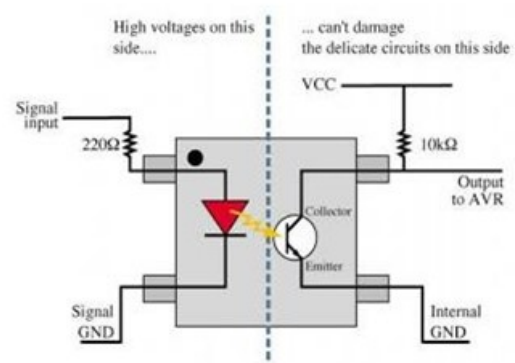
Figure 6. Optocoupler

A common type of opto-isolator consists of an LED and phototransistor in the same opaque package as shown in Fig.6. Other type of source –sensor combinations include LED-photodiode, LED-LASER and lamp-photo resister pairs. Usually photo-isolators transfer digital(on-off) signals, but some techniques allow them to be used with analog signals.

AURDINO UNO:

Arduino is an open source software and hardware company, project and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical world. The microcontrollers are typically program using a dialect of features from the programming languages C and C++.

Figure 7. Aurdino UNO

The name arduino comes from a bar in Ivrea, Italy. Arduino is an open source hardware. Arduino microcontrollers are pre-programmed with a bootloader that simplifies uploading of programs to the on-chip flash memory. Fig.7 shows the Aurdino UNO.

This Arduino used in DC motor control using arduino and H-Bridge and impedance sensor system.

ZIGBEE:

Zigbee is a wireless technology developed as an open global standard to addressed the unique needs of low-cost, Low-power, Wireless sensor network. Zigbee is set of specs build around the IEEE 802.15.4 wireless protocol. The Zigbee technology is broadly adopted for bulk and fast data transmission over a dedicated channel. Zigbee module is shown in Figure 8.

The major advantage of this system is making use of zigbee module which helps for an wireless transmission. We can also enjoy the freedom of sharing same reading with a multiple Zigbee ports where we need not required the multiple transmitter. The distances that can be achieved transmitting from one station to next extend upto about 70meter, Although very much greater distances may be reached by relaying data from one node to next in the network.

Figure 8. ZigBee Module

GSM:

GSM (Global System For Mobile Communication, originally groups special mobile) is a standard developed by the Europe Telecommunication standards institute(ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets, first deployed in Finland in December 1991. GSM operates in 900MHz band (890Mhz-960MHz) in Europe and Asia and in the 1900MHz (sometimes referred to as 1.9GHz) band in the United state. GSM is also the basis for Integrated Digital Enhanced

Network(iDEN). GSM network is used to sending SMS to the local authorities regarding the theft cases. GSM module is shown in Fig.9. A GSM based wireless communication module is integrated with the electronic energy meter of each entity to have remote access over the usage of electricity.

Figure 9. GSM(Global System For Mobile

LCD:
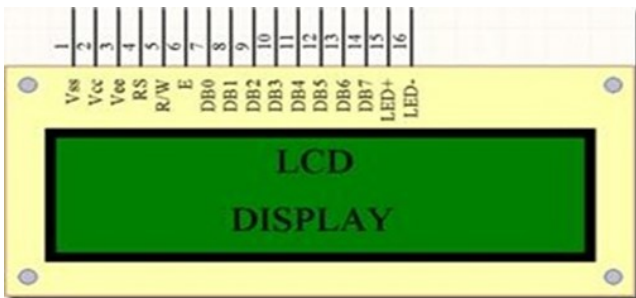
Figure 10. LCD Display

"A light-emitting diode (LED) is a two lead semiconductor light source. It is a p-n junction diode that emits light when activated. When a suitable voltage is applied to the leads, electrons are able to recombine with electron holes within the device, releasing energy in the form of photons." LED have many advantages over incandescent light sources, including lower energy consumption, longer lifetime, improved physical robustness, smaller size and faster switching. Light-emitting diodes are used in application as diverse as aviation lightning, traffic signals. They are also significantly more energy efficient and arguably, have fewer environmental concerns linked to their disposal.

LEDs have led to new display and sensors, while their high switching rates are useful in advanced communications technology.

Conclusion and Future Scope: We believe that there is definitely a place in the market for ZIGBEE & wireless HART (Highway Addresable Remote Transducer Protocol) Industry can further extended use of ZIGBEE in remote controlled application. It can be used for providing control through mobile phones. The data like reactive power, apparent power & power factor with a sign also can be sensed through this network by simply tracking the internal register of the chip. Basing on the address application, we present an improved routine protocol according to different packed types in AMR system to realize less data latency and better transmission reliability in local terminal. In future work, we plan to research and construct more complex ZIGBEE wireless network for industry monitoring system. This working prototype of ZIGBEE based AMR system is to demonstrate the upgrading made to traditional meter is very effective. It has low infrastructure cost simple and easy installation that resolves the reading problem of manual meters.

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Study of Heat Transfer Using Nanofluids in Automobile Radiator with Twisted Tubes

Preet Singh Khokhar, Ahmed Saif Ali Khan, Sagar Lodhi, Atul Kumar, Faaez Sheikh, Prem yelmalwar, Mohammad Ashfaque, MD. Naushad Alam

Mechanical Engineering, ACET, Nagpur, Maharashtra, India
Asst. Professor, ACET, Nagpur, Maharashtra, India

ABSTRACT

Automobile industries nowadays are going for various advancements in their technology, automobile radiator is one of them. Researches prove that nanofluids have better thermal conductivity as compared to conventional coolants. By using those nanofluids in an automobile radiator, various results of heat transfer will be analyzed. Also, by replacing conventional radiator with twisted tube radiator there will be observable increase in the turbulence. This research paper shows various properties of nanofluid and shows their use in radiator for beneficial results in heat transfer.

Keywords : Nanofluids, automobile radiator, twisted tubes, thermal conductivity, cooling system.

I. INTRODUCTION

Nanoparticles are the particles having size that ranges from 1 to 100 nm. They are also called as Ultra-fine particles. Particles as small as 10 nm have been used in nanofluid research. When particles are not spherical but rod or tube-shaped, the diameter is still below 100nm, but the length of the particles may be on the order of micrometers. It should also be noted that due to the clustering phenomenon, particles may form clusters with sizes on the order of micrometers.

A nanofluid is the suspension of nanoparticles in a base fluid. Nanofluids are those fluids that show promising properties of heat transfer enhancement due to their anomalously high thermal conductivity.

II. PHYSICAL PROPERTIES OF NANOFLUID

1. **Thermal conductivity,** k The thermal conductivity of all nanofluids was measured using a KD2 Pro conductimeter (Decagon Devices Inc.). The KD2 Pro is the commercial device that measures the thermal conductivity with the help of the transient hot wire technique. The sample was introduced in a sealed glass tube (22 ml) where the sensor was inserted vertically. It is very important to ensure the vertical position of the needle to reduce convective heat transfer inside the sample and improve the accuracy of the measurements, especially for low viscosity nanofluids. The heat conductance is inversely related to the characteristic dimension of the probe inserted into the fluid which depends on the direction of fluid flow over the probe. When considering a heated

probe inserted into a cooler fluid, the fluid flow near the probe from free convection will be upward, as the warmer, less dense material near the probe is forced upwards by forces of gravity working on the surrounding, denser material. If the needle is inserted into a fluid vertically, the fluid flow will be parallel to the axis of the needle, and the characteristic dimension is the length of the needle, not the diameter, thus decreasing the free convection.

2. Specific heat, cP The specific heat for each nanofluid was measured in a Differential Scanning Calorimeter (DSC), model DSC1 (Mettler Toledo, USA). The calculation of the specific heat capacity is based in the DIN standard (DIN 51007), The sequence used in the determination was as follows: isotherm of 5 minutes at 25ºC, dynamic segment from 25ºC to 95ºC at heating rate of 10ºC/min and isotherm of 5 minutes at 95ºC. As a consequence of the nature of the sample (liquid) the crucible (Aluminium) was sealed in order to avoid loss of material by evaporation.

3. Viscosity, η The viscosity and rheological behaviour of nanofluids were obtained by conducting tests under steady state conditions using a Haake RheoStress 1 rotational rheometer (Thermo Scientific). A cylinders system composed of two concentric cylinders was used. In the gap between the inner cylinder (diameter = 34 mm) and the outer cylinder (diameter = 36.88 mm) the sample was introduced. Before each test, a pre-treatment, in which the samples were submitted to a constant shear stress, was applied to the nanofluids for 30 seconds to ensure similar starting conditions for all the measurements.

4. Stability The stability of the nanofluids was analysed through the evolution of the amount of light backscattered by the nanofluid from an incident laser beam. A Turbiscan Lab Expert (Formulaction SA, France) was used to carry out the tests. Measurements are based on the multiple light scattering theory. This equipment consists of a pulsed near-infrared light source and a detector that measures the light backscattered by the sample. For each nanofluid, the backscattering profiles were obtained along the height cell. To analyse the stability of nanofluids the measurements were carried out at different time intervals up to a total time of 48 hours.

5. Clustering Clustering is the formation of larger particles through aggregation of nanoparticles. Clustering effect is always present in nanofluids and it is an effective parameter in thermal conductivity. Hong et al. [58] investigated this effect for Fe(10 nm)/ethylene glycol nanofluids. The thermal conductivity of nanofluids were determined as a function of the duration of the application of the ultrasonic vibration, which was varied between 0 min, that is, no vibration applied, and 70 min. It was seen that thermal conductivity ratio increased with increasing vibration time and the rate of this increase became smaller for longer vibration time. Furthermore, the variation of thermal conductivity of nanofluid with time after the application of vibration was investigated and it was found that thermal conductivity decreased as time progressed. Below table shows various properties of nanofluid with different base fluids-

Considering the above properties , availability and cost taking **Cuo** as nanoparticle into account for the experiment conduction.

III. NANOFLUID PREPARATION

There are mainly two methods of nanofluid production, namely, two-step technique and one-

step technique. In the two-step technique, the first step is the production of nanoparticles and the second step is the dispersion of the nanoparticles in a base fluid.

Nanoparticle	Base fluid	Size (nm)	Enhancement of thermal property (%)	Preparation method
CuO	DI water	20	12.4	Single step
	Water	31	5.5	Two step
	EG	31	9	Two step
	EG/water	27	15.6-24.5	Two step
	DI water	50	13-25	Two step
Al₂O₃	EG/water	36.5	9.8-17.8	Two step
	EG	13	12.82	Two step
	EG/water (20:80)	36	32.36	Two step
	EG/water (40:60)	36	30.51	Two step
Al₂O₃/Cu	Water	15	13.6	Single step
TiO₂/Cu	Water	55	68 (Heat transfer coefficient)	Single step
Nano Diamond/ Nickel	Water	30	21	Two step
Nano Diamond/ Nickel	EG	30	13	Two step
MWCNT/γ Alumina	Water		20.6	Two step
Ag/MWCNT/Graphene	DI water/EG		20	Single step
Ag/MWCNT/Graphene	DI water	<10nm	8	Single step

Table 1 Literatures of CuO, Al₂O₃ and Hybrid nanofluid.

Two-step technique is advantageous when mass production of nanofluids is considered, because at present, nanoparticles can be produced in large quantities by utilizing the technique of inert gas condensation. The main disadvantage of the two-step technique is that the nanoparticles form clusters during the preparation of the nanofluid which prevents the proper dispersion of nanoparticles inside the base fluid .

One-step technique combines the production of nanoparticles and dispersion of nanoparticles in the base fluid into a single step. There are some variations of this technique. In one of the common methods, named direct evaporation one-step method, the nanofluid is produced by the solidification of the nanoparticles, which are initially gas phase, inside the base fluid. The dispersion characteristics of nanofluids produced with one-step techniques are better than those produced with two-step technique. The main drawback of one-step techniques is that they are not proper for mass production, which limits their commercialization .

IV. TWISTED TUBE RADIATOR

A radiator consists of longitudinal tubes through which coolant flows. The outlet of the engine block acts as the inlet of radiator and vice-versa. The flow through radiator takes place with the help of radiator tubes that are encased inside a radiator. Now, these tubes when replaced by twisted ones, makes it a twisted tube radiator. The following diagram displays a contrast between a conventional radiator tube and a twisted tube.

V. EXPERIMENTAL SETUP

An engine, two radiators- one conventional and another fabricated with twisted tubes, nanofluid (SiO2), venturimeter, thermometer.

VI. HEAT TRANSFER CALCULATIONS

Using effectiveness NTU method based on below mentioned formulae for heat transfer calculation -

1. Energy balance equation,

   (mCp)h (Thi-The) = (mCp)c (Tce-Tci)
   Where,
   m= mass flow rate of coolant
   Thi ; The= temperature of coolant at inlet and exit respectively.
   Tci ; Tce= temperature of air at inlet and exit respectively.
   Cph ; Cpc=specific heat of coolant and air respectively.

2. Heat transfer,
   q = mw×Cpw×ΔTw

3. LMTD,

$$\theta m = \frac{17.517 - 16}{\ln\left(\frac{17.517}{16}\right)}5$$

4. Flow area,

$$Af = \frac{m}{V\infty\rho}$$

Where,

Af = Total flow area

V = Average velocity of water

ρ = Density of water

5. $Af = n \times \frac{\pi}{4} \times d1^2$

Where, n = Number of tubes

d1= Inlet diameter of tube

6. For correction factor required dimension parameters are,

$$P = \frac{(Tce - Tci)}{(Thi - Tci)}$$

Refer the graph given below for the correction factor-
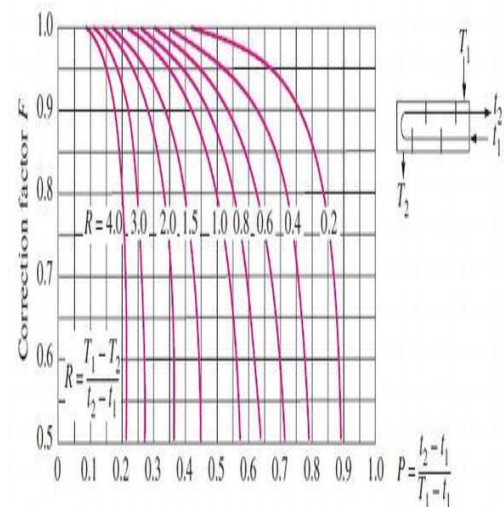
7. Area of the heat transfer after considering correction factor is given as,

$$A = \frac{q}{U.F.\theta m (counter\ flow)}$$

8. Final acceptable design parameters
   - Number of tubes per pass
   - Number of passes

- Length of tube per pass

9. Effectiveness of Heat Exchanger

$Ch = (m \times Cp)water$

$Cc = (m \times Cp)air$

(a) Capacity ratio (C) :

$$C = \frac{Cmin}{Cmax}$$

(b) NTU :

$$NTU = \frac{U.A}{Cmin}$$

10. Effectiveness

$\varepsilon = 1 - \exp$

$$\left[\left(\frac{1}{C}\right)(NTU)^{0.22}\left\{\exp[-C(NTU)^{0.78}]-1\right\}\right]$$

VII. CONCLUSION

Nanoparticle exhibits phenomenal behavior when it comes to heat transfer properties. It has countless number of applications one of which is heat transfer rate.

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High Strength Concrete Interlocking Pavement Blocks for Heavy Loading Vehicles

Mohammad Adnan Adil, Nomaan Sheikh, Enamul Hauque, Sujin George
Department of Civil Engineering, Rashtrasant Tukadoji Maharaj Nagpur University/ Anjuman College of
Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

The rapid development in concrete material technology, leads to revolutionary development in the construction of major structure. Such development requires special concrete which have to accomplish multiple demands such as high strength, workability, ductility under overload and earthquake. High performance concrete are specially designed to meet the requirement of such major structure. Revolutionary development in Indian construction industry has raised the use of interlocking concrete pavement block in different areas where conventional Construction of pavement is not feasible. Recent studies show that in modern construction practices, the industrial chemical waste or by products are used in concrete. The industrial waste which can be easily procured and have possibility to be used in concrete effectively is used engine oil. This work aims to investigate the effect of used engine oil on the performance of fresh and hardened properties of high strength ICPB.

Keywords: used engine oil, interlocking concrete pavement block, high strength concrete, ductility, workability.

I. INTRODUCTION

This investigation aim to examine the performance and alteration in fresh and hardened properties of high strength interlocking concrete pavement block of M60 grade by using mineral admixture, over the years the application of high strength concrete has taken its due place in Indian construction scenario. The application of high strength concrete is found to be common in many different countries. High strength concrete ranging from 40 MPA to 80 MPA has been used in India for various different heavy structures. The most important aspect of high strength concrete is mix design. According to IS the mix design is defined as "the process of selecting suitable ingredient of concrete and determining their relative proportion with the objects of producing concrete of certain minimum strength and durability as economical as possible. The capital aim of mix design is to accomplish the minimum stipulated strength and durability of concrete in most economical manner. For proportioning in connection with a concrete mixes the four major factor are 1.Water cement ratio 2. Cement content 3. Gradation of aggregate 4.Consistency. With the advent of special additive, it has been feasible to produce the concrete of higher strength as compared to normal one. These special additives may be in the forms of chemical and mineral admixture. latest research suggest that there is a

worldwide trend to investigate the practical and serviceable implementation of processed and unprocessed municipal or industrial product or by product as raw or additive ingredient in concrete. The object of such investigation is two fold. The first objective is to conserve the environment from the ill effect of such waste by reusing it in another form. The second objective is reducing the cost of concrete by replacing waste material with original material or substituting the waste material as additives, this will also help in reducing the cost of treatment and disposal of waste many of non-recyclable waste can be used as mineral additive and admixture which can improve the fresh and hardened property of concrete. Latest survey report that more than 55% of used engine oil is thrown away by users in the environment without any treatment. The UEO is a lubricant which separates the different part of machine and reduce the friction. ICPB technique is extensively used in heavy traffic and very heavy traffic areas in many part of worlds. Now a days in India there is a trend of using high strength IPCB in highway pavement or in terminal area, where other method of construction is not feasible.

II. LITERATURE SURVEY

Md. Ashraful Alam and B. Hidayah carried out the research on used cooking oil (UCO) as mineral admixture in concrete. They investigated the compressive strength and slump value property. It was noted that the compressive strength increases with the increment of UCO up to 2%, and the slump value also increases with the increment of dosage of UCO.

Sanjay Srivastava and Dr S.S Jain carried out the investigation on high strength concrete of M60 grade for high pavement for heavy vehicle. They develop high strength concrete of M60 grade by

using fly ash. They examine the different properties of concrete. They concluded that 11% fly ash by weight of cement can be effectively used to produce high strength concrete, which results in greater saving in cement and reduction in heat.

III. RESEARCH OBJECTIVES

1. An attempt to improve the quality of concrete by reusing different waste materials as additive.
2. To design the high strength concrete in economical manner.
3. To develop the concept of recycling the waste material in construction sector, which helps in reducing the cost of building materials and it also saves environment.

IV. EXPERIMENTAL EXAMINATION

1. Cement

The main function of cement is to bind all ingredients of concrete. Ordinary Portland cement of ACC Company, grade-53 confirming to IS 8112-1989 was used throughout the experimental work. Generally 53 grade of cement is used for superior quality of works. The following table shows the physical properties of cement used in this project work.

Table 1

S.no	Properties	Results	IS standard range
1.	Specific gravity	3.01	3-3.15
2.	Fineness	5.34%	Not Less than 10%
3.	Std. consistency	30%	No standard range
4.	Setting time		

	i. initial	30min.	Not less than 30 min.
	ii final	560 min.	Not greater than 600 min.

2. Coarse aggregate

The aggregate comprise of approximately 75-80% volume of mass concrete. The locally available crushed aggregate of size ranging from 10-20mm confirming to IS 383- 1987 is used. Table shows the properties of coarse aggregate.

Table 2

S.no	Properties	Results	IS standard range
1.	Specific gravity	2.756	2.5-3.0
2.	Water absorption	0.443%	0.1%-2%
3.	Impact value	20%	Not more than 30%
4.	Crushing value	19%	Not more than 30%

3. Fine aggregate

Natural river sand passing from 4.75mm IS sieve confirming to IS 383-1987 is used. Table shows the properties of fine aggregate.

Table 4

S.no	Properties	Results	IS standard range
1.	Specific gravity	2.56	2.4-3.0
2.	Water absorption	1.002%	0.1%-2%
3.	Fine modulus	2.60	2.5-3

4. Admixtures

A] Polycarboxylate ether

The superplasticizer admixture named polycarboxylate ether is used. It is high range water reducer's chemical admixture which allows reduction in water content; generally it is used for making superior grade of concrete, high performance concrete and self-compacting concrete. The specific gravity of P.C.E is 2.

B] Used engine oil

Used engine oil is a lubricant or any petroleum based product which got contaminated and cannot be used further, due to loss of its original properties. U.E.O is used as mineral admixture in this experimental investigation

V. EXPERIMENTAL PROGRAMME

Results obtained during investigation on fresh and hardened concrete are discussed in following charts.

Results of fresh concrete

A] Slump value

The chart -1 shows the variation of slump [mm] of concrete with varying dosage of different admixture. [C.M- control/reference mix, P.C.E-Polycarboxylate ether, U.E.O-used engine oil]
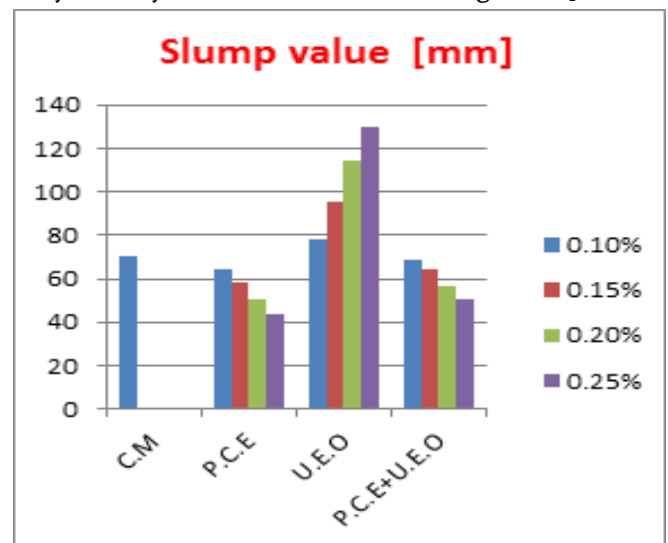
Chart 1

B] Initial setting time

Chart-2 shows the variation in initial setting time of different mixes made with different admixture of varying dosage.
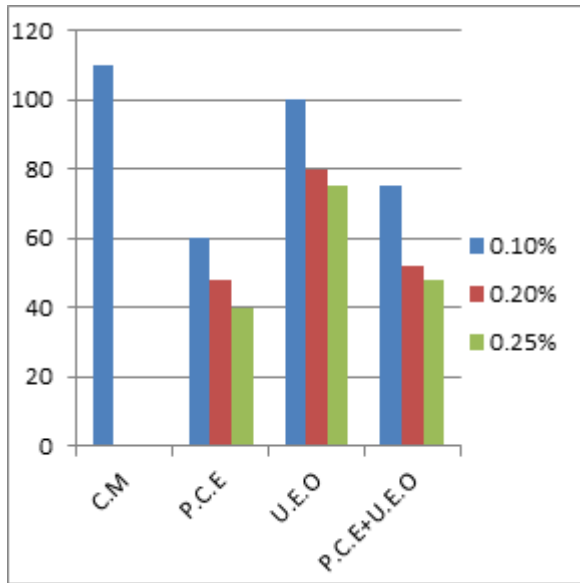
Chart 2

Results of hardened concrete

A] Compressive strength

The following charts show the variation in compressive strength of concrete for different mix at different ages – 3days, 14days, and 28days. It can be seen that with increase in P.C.E content, the concrete gains the high early strength. There was decrease in strength value with increasing content of U.E.O, from 0.1 to 0.25% content, it shows the positive growth in the strength, further increment shows the decrease in strength.
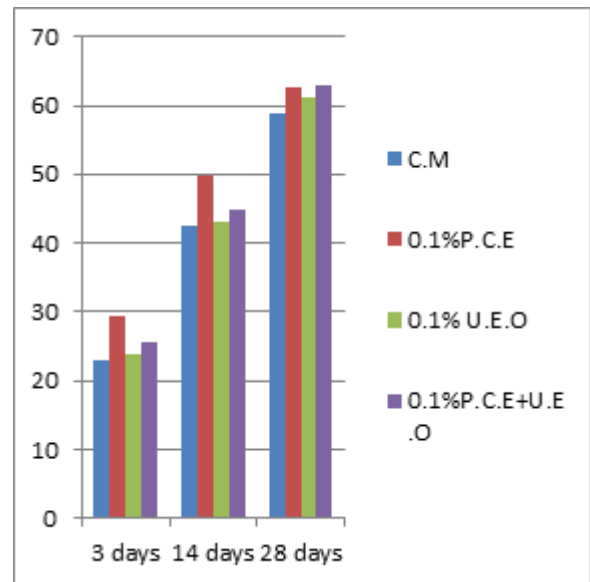
Chart 3. concrete compressive strength at different ages with 0.1% dosage of different admixture
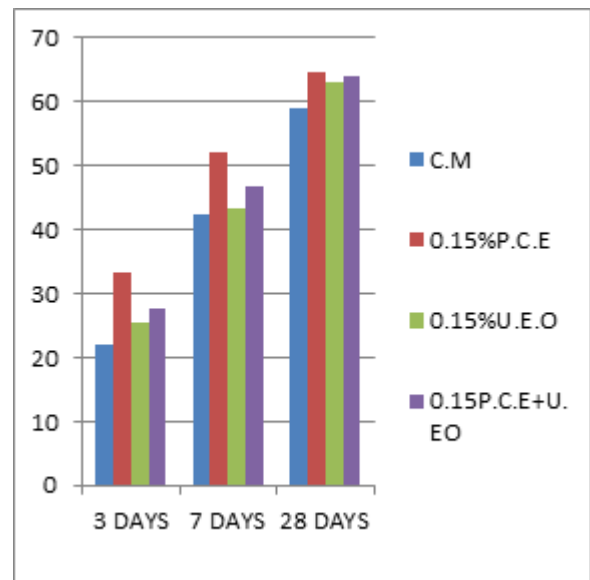
Chart 4. concrete compressive strength at different ages with 0.15% dosage of different admixture
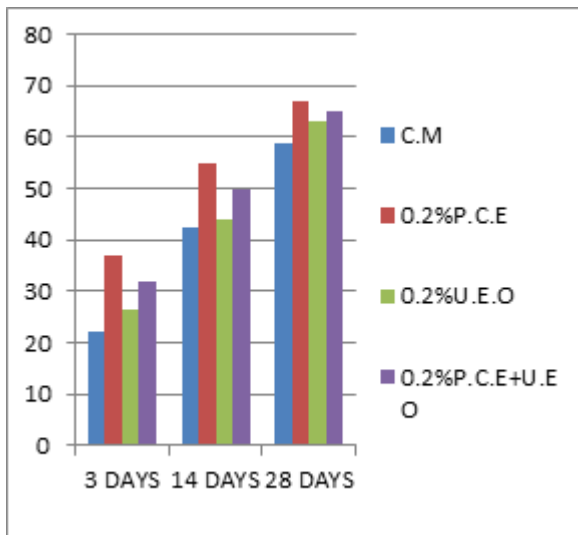
Chart 5. concrete compressive strength at different ages with 0.2% dosage of different admixture

VI. VI. CONCLUSION

Based on the above experimentation, the conclusions made were

1. The utilization of used engine oil as a mineral admixture is a good alternative, as it improves the performance of concrete, and did not show negative effect on the fresh and hardened properties of concrete if mixed in proper proportion as well as it reduces the environmental problems and concrete cost too.

2. It was observed that, as the content of used engine oil increases, it will eventually lead to fluidity loss due to which setting decreases.

3. The desired strength and performance was observed with the addition of superplasticizer, there is no negative effect on the strength parameter with the increasing content of superplasticizer in concrete, but the setting time decreases drastically.

4. Early high strength can be easily gained with the use polycarboxylate ether, as reduction in water cement ratio leads to increase in strength.

5. Gradation of aggregate and fineness modulus plays a significant role in development of high strength concrete.

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"Literature Review for Staircase Slider Mechanism for Person with Lack of Mobility"

Ismail S. Laddhani[1], Prof. M. Sohail Pervez[2]

[1] MTech. (MED)Student of Mechanical Engineering Department Anjuman college of engineering and technology college Nagpur, Maharashtra, India

[2] Assistant Professor of Mechanical Engineering Department Anjuman college of engineering and technology college Nagpur, Maharashtra, India

ABSTRACT

Preserving the mobility of elderly people is becoming increasingly important, as other factors of quality of life. Products that preserve the mobility of elderly people can therefore significantly improve their independence and lifestyle. Based on the changes in the age structure of society, demographic change also means to increasingly utilize available support by technical systems to allow people a self-dependent and self-determined life. This review research is established for determining various modes for modification in the homes where people spend large part of their lives especially focusing on the homes of disabled, who likely to spend more at home.

Keywords: Design for elderly people; mobility

I. INTRODUCTION

Senior citizens or persons with physical disability, a fall can mean the loss of independence and mobility. Often due to osteoporosis, bones are much more fragile, so a low impact fall can quickly turn into injury. Up to 15% of falls result in injuries, the most serious of which is hip fracture and up to half of all people who have a hip fracture never get back to their previous level of independence. The risk factors for falls among older people can be classified into three categories: intrinsic, extrinsic and exposure to risk (Todd and Skelton, 2004). Intrinsic factors include age, gender, living alone, medicine, medical conditions, impaired mobility and gait, nutritional deficiencies, impaired cognition, visual impairments, and foot problems. Extrinsic factors include poor lighting, slippery floors, uneven surfaces, footwear and clothing, inappropriate walking aids or assistive devices. Exposure to risk concerns levels of activity and inactivity. Intrinsic factors are considered more important among people aged 80 and over (suggesting they are less active) and extrinsic factors more important among older people under 75 (suggesting they are more active). Of all the areas in the home, the staircase is the most frequent place for a fall and is also the most likely place to cause injury. It is common for senior to become anxious on the stairs, even more so if they had a previous falls. This anxiousness can also increase the risk of a fall, which is why remaining calm is so important. The person might also decide

to simply avoid attending those areas where stairs are only means of reach. While effective to a degree, they do not really or fully address the actual issue at hand, which is being able to use the stairs safely and with confidence.

In this context, the focus of considerations related to mobility support by technical systems are elderly people respectively people with performance restrictions. Not only because of the variety in the occurrence of performance restrictions but also by the diversity of biographies (social integration, career, life experiences), elderly people are a very heterogeneous group with diversified needs and requirements for technical systems.

According to Census 2011, India is having 8 % of total population lying in the age group bifurcation of + 60 and 2.21% of total population in the category of people with movement disabilities which make these groups dependent on others to aid them in various chores of day to day life in public and where as in their own homes too.

The urbanization started some 20 years ago and has taken much of the City limits to get compressed nearest to the amenities which resulted in high rise. Most residential buildings were granted the permission to build up to Ground plus 2 or 3 storied, wherein Elevator was not installed. Since at that time, it was not considered necessary and people preferred to climb stairs, irrespective of all odds. Consequent to the Life-Style changes, including physical and mental apathy, currently the four storey building residents have started to feel the need for having a Elevator in their buildings. But now many factors abide them such as local body governing rules for town planning, constructional requirement and cost of installation of the Elevator.

II. VISION FOR THIS RESEARCH

A comprehensive approach to mobility does not only conduce to great potential for innovation for mobility support. The challenge for project development is also to consider the variety of influencing factors that determine the requirements for mobility-aided systems and the associated possibilities for finding solutions. This review is a preliminary step which will assist me taking correct decisions in concern with design and calculation for slider mechanism.

Transmission drives that can be used for moving the slider up/down the side rail :-

A. Power screws

A lead screw also known as a power screw or translation screw, is a screw used as a linkage in a machine, to translate turning motion into linear motion. Because of the large area of sliding contact between their male and female members, screw threads have larger frictional energy losses compared to other linkages. They are not typically used to carry high power, but more for intermittent use in low power actuator and positioned mechanisms.

Advantages of a leadscrew
  I. Large load carrying capability
  II. Compact and Simple to design
  III. Large mechanical advantage
  IV. Precise and accurate linear motion
  V. Smooth and quiet
  VI. Minimal number of parts
  VII. Most are self-locking

Disadvantages of a leadscrew
  I. Not very efficient - due to the low efficiency they cannot be used in continuous power transmission applications.

II. They also have a high degree of friction on the threads, which can wear the threads out quickly. For square threads, the nut must be replaced; for trapezoidal threads, a split nut may be used to compensate for the wear.

B. Chain drives

Chain drive is a way of transmitting mechanical power from one place to another. Most often, the power is conveyed by a roller chain, known as the drive chain or transmission chain, passing over a sprocket gear, with the teeth of the gear meshing with the holes in the links of the chain. The gear is turned, and this pulls the chain putting mechanical force into the system.

Advantages of chain drive

I. Do not slip or creep, and so are more efficient than belt drives
II. Are more compact than belt drives
III. Operate effectively at high temperatures
IV. Are often easier to install than belt drives
V. Do not deteriorate due to oil, grease, sunlight, or age
VI. Can withstand abrasive conditions
VII. Can operate in wet conditions
VIII. Can be used on reversing drives

Disadvantages of chain drive

I. Cannot be used in applications where the drive must slip
II. Require more precise alignment than belt drives
III. Typically require frequent lubrication
IV. Are noisy and can cause vibrations
V. Do not have the load capacity or service life of gear drives

C. Rope drive

Rope drive (do not mistaken with round belt) is used where a large amount of power is needed to transfer for a long distance (more than 8m). The rope runs over a grooved pulley. There are two types rope drive Fiber Rope and Wire Rope.

Advantages of rope drive

I. Significant power transmission.
II. It can be used for long distance.
III. Ropes are strong and flexible.
IV. Provides smooth and quiet operation.
V. It can run any direction.
VI. Low-cost and economic.
VII. Precise alignment of the shaft not required.

Disadvantages of rope drive

I. Internal failure of the rope has no sign on external, so it if often get unnoticed.
II. Corrosion of wire rope.

D. Belt drive

A belt is a looped strip of flexible material used to mechanically link two or more rotating shafts. A belt drive offers smooth transmission of power between shafts at a considerable distance. **Belt drives** are used as the source of motion to transfer to efficiently transmit power or to track relative movement.

Advantages of belt drives:

I. Belt drives are simple are economical.
II. They don't need parallel shafts.
III. Belts drives are provided with overload and jam protection.
IV. Noise and vibration are damped out. Machinery life is increased because load fluctuations are shock-absorbed.
V. They are lubrication-free. They require less maintenance cost.
VI. Belt drives are highly efficient in use (up to 98%, usually 95%).
VII. They are very economical when the distance between shafts is very large.

Disadvantages of belt drives:

I.   In Belt drives, angular velocity ratio is not necessarily constant or equal to the ratio of pulley diameters, because of slipping and stretching.

II.   Heat buildup occurs. Speed is limited to usually 35 meters per second. Power transmission is limited to 370 kilowatts.

III.   Operating temperatures are usually restricted to −35 to 85℃.

IV.   Some adjustment of center distance or use of an idler pulley is necessary for wearing and stretching of belt drive compensation

E. Gear drives (Rack and Pinion)

A rack and pinion is a type of linear actuator that comprises a pair of gears which convert rotational motion into linear motion. A circular gear called "the pinion" engages teeth on a linear "gear" bar called "the rack"; rotational motion applied to the pinion causes the rack to move relative to the pinion, thereby translating the rotational motion of the pinion into linear motion.

Advantages of Rack and Pinion

I.   Cheap

II.   Compact

III.   Robust

IV.   Easiest way to convert rotation motion into linear motion

V.   Rack and pinion gives easier and more compact control over the vehicle

Disadvantages of Rack and Pinion

I.   Since being the most ancient, the wheel is also the most convenient and somewhat more extensive in terms of energy too. Due to the apparent friction, you would already have guessed just how much of the power being input gives in terms of output, a lot of the force applied to the mechanism is burned up in overcoming friction, to be more precise somewhat around 80% of the overall force is burned to overcome one.

II.   The rack and pinion can only work with certain levels of friction. Too high a friction and the mechanism will be subject to wear more than usual and will require more force to operate.

III.   The most adverse disadvantage of rack and pinion would also be due to the inherent friction, the same force that actually makes things work in the mechanism. Due to the friction, it is under a constant wear, possibly needing replacement after a certain time

III. REVIEW OF LITERATURE

1.1. **Platform of Design Method for developing mobility-preserving products:** [1] Elderly people partly have individual barriers in handling technical systems as well as in the use of public and private spaces. Uncertainty and fear of handling technical systems have to be taken seriously as well as aspects of stigmatization to ensure the acceptability of the product. The user does not want and should not be necessarily confronted with the entire complexity of technical systems. Any forms of barriers in the use of technical aids have to be avoided. Elderly people need a sustainable support by technical systems. The support should be available so far as it is necessary to obtain or to train the performance. Only when this is no longer sufficient to satisfy mobility needs, the technical system should compensate the lost

performance (support hierarchy). For the derivation of technical aids a holistic mobility model is required that reflects not only the mobility situation but also considers individual conditions and social factors as well as the characteristics of public and private space more closely. The methodological development of product lines requires an implementation of the analyzed situations of mobility into concrete requirements. With these factors, the requirements related to the product line can be completed in terms of acceptance and concomitantly deliver reference criteria to ensure a process attendant property validation.

1.2. Tall Buildings and Elevators: A Review of Recent Technological Advances: [2] Efficient vertical mobility is a critical component of tall building development and construction. This paper investigates recent advances in elevator technology and examines their impact on tall building development. It maps out, organizes, and collates complex and scattered information on multiple aspects of elevator design, and presents them in an accessible and non-technical discourse. Importantly, the paper contextualizes recent technological innovations by examining their implementations in recent major projects including One World Trade Center in New York; Shanghai Tower in Shanghai; Burj Khalifa in Dubai; Kingdom Tower in Jeddah, Saudi Arabia; and the green retrofit project of the Empire State Building in New York. Further, the paper discusses future vertical transportation models including a vertical subway concept, a space lift, and electromagnetic levitation technology. As these new technological advancements in

elevator design empower architects to create new forms and shapes of large-scale, mixed-use developments, this paper concludes by highlighting the need for interdisciplinary research in in corporating elevators in skyscrapers.

1.3. Mathematical models used in gear dynamics—A review: [3] With increased demand for high speed machinery, the mathematical modelling of the dynamic analysis of gears has gained importance. Numerous mathematical models have been developed for different purposes in the past three decades. In this paper the mathematical models used in gear dynamics are discussed and a general classification of these models is made. First, the basic characteristics of each class of dynamic models along with the objectives and different parameters considered in modeling are discussed. Then, the early history of the research made on gear dynamics is summarized and a comprehensive survey of the studies involved in mathematical modelling of gears for dynamic analysis is made. Generally, a chronological order is followed in each class studied. The goal is not just to refer to several papers published in this field, but also to give brief information about the models and, sometimes, about the approximations and assumptions made. A considerable number of publications were reviewed and 188 of them are included in the survey.

1.4. Designing and analysing stair case lift system:[4] A stair case lift is a safe and secure method for human transportation which is a mechanical device for lifting people and wheelchairs up and down stairs. As we know

the elevators had been made a lot of developments until it reached to the elevators that we see nowadays in the markets or other places. Sometime the elevator needs extra depth underground for installing and especially in the tall buildings that are consist of many storeys. The argument of people about lifts began with simple rope or chain. The development of industries and beam construction together is the main reason to improve the technology of elevators that we see nowadays. After the installation of the lifts the alteration will be very difficult so the cost will be too much. The lifts basically depend on mechanical means either pulling or pushing the platform. In the old buildings that do not have elevators or consist of two floors must have a device for transportation as we mentioned before. So we made a research to fill this blank, because it is easy to install and cheap and not needed maintenance. We will mount two rails to the stairs one of them for connecting the track gear and the other for supporting. The attachment of lifting platform or chair to the rail is done by using rack and pinion. The device is working by D.C. motor which gives motion to chair or platform by gears.

1.5. Design and Finite Element Analysis of a Stair Case Material Handling System: [5] : This topic deals with the fabrication and analysis of a stair case lift, which can be use as Material Handling System. A stair case lift is a mechanical device for lifting people and wheelchairs up and down on the stairs, who may find difficulty in doing so themselves. In this paper, the final design was an outcome of a sequential analysis and modification of stages. And it was deduced that Stair lifts are easily installed into any situation where the

condition of the stair tread is good as the railing that the chair lift uses is attached to the stair tread. During the test run of this project, it was realized that the model would be capable of carrying heavy load without suffering any deformation or local fractures if it would go into real world production at an ideal scale Therefore it can be widely used for home as well as industrial which ensures a promising future to the concept.

IV. OVERVIEW

Staircase slider is defined as a lift in the form of a platform that can be raised or lowered at the edge of a domestic staircase, used for carrying a person with walking difficulties. Once it has become too difficult to climb the stairs, one might decide that the house will need to be rearranged so that there is a bedroom and a bathroom downstairs, or he/she will decide to move to a bungalow with no stairs to climb. Staircase slider can provide a `great deal of freedom and independence, and can mean that there's no need to transform current house arrangement or to move to a bungalow, or build an extension.

V. CONCLUSION

The proposed work is determined for design and fabrication of staircase slider for persons with physical difficulties to climb the stairs by their own. Staircase slider will be a mechanism for home lifting aid that will allow an individual to slide over the staircase as well as can utilize the same staircase for pedestrian purpose also. The slider mechanism will carry an individual up the stairs, attaching directly above the staircase railing. In this case, an individual must remain standing as they use this slider. This design will not require overhead control room and it will not be necessary to have structural alteration to

the building. The only basic requirement will be that staircase width should be at least in between 75cm – 100cm in width.

VI. METHODOLOGY

- Data accumulation
- Literature survey
- Selection and Design of drive system
- Design of slider platform
- CAD modeling of staircase slider system
- Analysis of design
- Modification of design if required after analysis
- Result discussion
- Design validation
- Design finalization

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"Relevance of Using Cupola Furnace in Current Scenario of Technological Advancements."

Huzaifa Fidvi[1], Dr. Akash Langde[2]

[1]Asst. Professor, Mechanical Engg. Department, Anjuman College of Engg. & Technology, Sadar, Nagpur, Maharashtra, India

[2]Prof. & Head, Mechanical Engg. Department, Anjuman College of Engg. & Technology, Sadar, Nagpur, Maharashtra, India

ABSTRACT

The present study is done to ascertain the relevance of using old conventional cupola furnace in these modern times of technological advancements. Despite the fact of the big development of the technology of melting cast iron in electrical furnaces, an essential part of melting cast iron especially in Indian SME context is still done in cupolas. Various technical papers are reviewed. Conclusions are drawn from these findings to know the need and importance of using Cupola Furnace for melting Cast Iron in the present era of technological advancements.

Keywords: Cupola, Electric Arc Furnace, Electric Induction Furnace, Duplexing, DBC, CCR, PCD.

I. INTRODUCTION

A foundry is a factory that produces metal castings. Metals are cast into shapes by melting them into a liquid, pouring the metal in a mould, and removing the mould material or casting after the metal has solidified as it cools.

The foundry industry manufacturers metal cast components for applications in Auto, Tractor, Railways, Machine tools, Defence, Aero, Earth Moving / Textile / Cement / Electrical / Power machinery / Pumps / Valves / Textile Machinery, Sanitary pipes & Fittings & Castings for special applications etc.

FOUNDRY

- ### GLOBAL SCENARIO

As per recent figures the global market of metal castings is estimated to be about **USD 30 billion** (Choudhary and Jain [1]).

- ### INDIAN CONTEXT

India is acknowledged as the **world's second largest** producer of castings producing 7.4 million tons per annum approximately valued at **USD 8 billion** with Exports approx. **USD 2 billions (Rs.12000 Cr).**

Indian Foundry Industry Scenario

Approx Units : 4600

Major Clusters: 19

Production   : 9 Million MTPA

Employment   : 5,00,000 Directly

15,00,000 Indirect

Productivity per Unit: 1950 MTPA

Avg. Productivity/Man/PA: 20

Max Productivity: 90

Location of Major Clusters

Each Cluster is known by the industrial products it is serving.

4600 Foundry Units are grouped in 19 Clusters

Table 1

Major Clusters	Famous For
Coimbatore	Pump-sets, Textile M/c castings
Kolhapur & Belgaum	Automotive castings
Rajkot	Diesel engine castings
Howrah	Sanitary castings
Batala, Jalandhar, Ludhiana	Machine Tools
Agra	Sanitary castings
Chennai	Electric Motor castings

Distribution of Foundries Sector wise:-

- 80% Units are in Small Scale Sector – Manual Labour Based
- 10 % Units are in Medium Scale Sector – Semi Mechanized
- 10 % Units are in Large Scale Sector – Mechanized and Some Are World Class

Various types of Furnaces used for melting metal to make Grey Cast Iron Castings are:

- Cupola
- Air furnace
- Rotary furnace
- Electric furnace.
  - ➢ Arc furnace
  - ➢ High frequency induction furnace

Furnace choice is dependent on the alloy system required, quantities produced. For ferrous materials Electric Arc and Induction Furnaces, Cupolas are commonly used. Air Furnace and Rotary furnace are small capacity furnaces and are used in tiny sector enterprises.

II. LITERATURE REVIEW

Literature review is done to ascertain the relevance of still using cupola furnace in these times of technological advances.

1. Bharati Vidyapeeths College of Engineering (BVP), New Delhi [2] notes discusses on the various furnaces used for melting. On 'Cupola furnace' it says that it is a very old method developed in early 1900's. For many years, the cupola was the primary method of melting used in iron foundries.
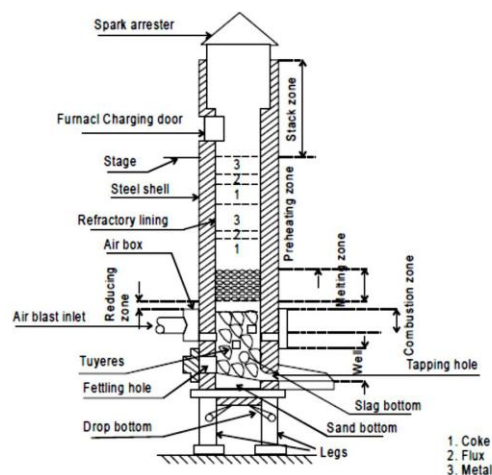
Figure 1. Typical Cupola Furnace

It has several unique characteristics which have made it popular for its widespread use as a melting unit for cast iron. (a) cupola is a tubular furnace which produces cast iron by melting scrap and alloys, the heat energy source being the energy generated from the combustion of coke (a coal derivative). (b) Continuous flow of molten iron emerges from the tap hole at the bottom. (c) Flow rates can be as high as 100 tonnes per hour. (d) As the metal melts, it is refined partially which removes contaminants, enabling use of dirty charges which is not possible in electric furnace.

Advantages listed of Cupola Furnace are:

- It is simple and economical to operate.
- Wide range of materials steel and iron without reducing melt quality are accepted.

- Dirty, oily scrap can be melted as well thereby playing an important role in the metal recycling industry.
- Cupolas can refine the metal charge, removing impurities out as slag.
- From a life-cycle perspective, cupolas are more efficient and less harmful to the environment than electric furnaces. This is because they derive energy directly from coke rather than from electricity that first has to be generated.
- The continuous rather than batch process suits the demands of a repetition foundry.
- It has high melt rates.
- Less floor space required compared with other furnaces of same capacity.

Limitations

- During melting, certain elements like Si, Mn are lost while others like sulphur are picked up. This changes the final analysis of molten metal.
- Close chemical composition and temperature control is difficult to maintain.

The paper summarizes that Cupola is a furnace used for melting steel scrap, cast iron scrap, and ferroalloys to produce cast iron. It is one of the oldest methods of producing cast iron, and it remains the dominant method because of its simplicity and low fuel cost the energy source being coke (coal derivative).

2. In technical paper [3], the author conducted a questionnaire based study among the foundries in Coimbatore area and noted that in mid twentieth century laws stipulating maximum level of pollutants were promulgated making the foundries install energy efficient electrical melting technologies & PCDs (Pollution Control Devices) especially induction furnace.

While stating the benefits of conventional cold blast cupola as lower cost of installation but it had too much dependence on skill and judgement of operator. The author noted that induction furnace being clean, energy efficient and well controlled melting process are replacing cupolas with their disadvantage being high initial cost and that only high quality metals can be melted.

Later Government of India imposed severe restrictions on power consumption, load shedding time limits forcing foundries to cut production. They were able to meet only 60% of their demand, compelling them to turn back to coke based cupolas while meeting environmental norms.

3. Michaela Boehm[4] in his comparative study between state-of-the-art cupola and medium frequency coreless induction melting compared them on factors such as energy costs, environmental regulations, charge materials, labour and production levels. Underlying these factors is one cost unit--dollars per ton of molten iron. All factors are quantified in dollars per ton of molten iron and then totalled to determine the cost-effective melt solution. Cost analysis of a 40 ton/hr cupola and a 40 ton/hr medium-frequency coreless induction melt system. The systems being analyzed are for Greenfield installation and 4000 hr/yr of operation. For this analysis, the melt systems are for a Midwest U.S. foundry that requires base iron for ductile iron and will melt 16 hr/day, five days a week.

III. MELT SYSTEM COST COMPARISON

(Dollars ($)/ton of iron melted)

Table 2

Cost Head	Cupola $/ton	Induction Furnace $/ton
Metallic Charge	135.44	151.73
Additive	9.29	12.98

Materials		
Melt Energy & Utilities	23.42	29.58
Labour	3.98	4.52
Refractory / Labour	1.76	3.07
Waste	1.48	0.51

Disposal		
Maintenance	6.40	4.40
Buildings and Other	10	10
Total	**191.77**	**216.79**

Total Cost Difference between cupola and medium frequency induction furnace is **$25.02/ton** of iron melted. Capital Investment is 25 % less for medium frequency induction furnace while Break Even level is 67000 tons annually for cupola and 165000 tons annually for induction furnace.

The cost per ton of iron melted is less for cupola and it has a lower break even point though with higher capital investment.

4. Dr. V. P. Gupta [5] in his study compared cupola which has a image in India as a dirty, polluting and energy inefficient melting method of small, foreman operated cast iron foundries producing non graded, poor quality general engineering castings with modern induction furnaces.

He also noted that India is the 2nd largest producer of castings in the world and that 35% of C.I. Castings are produced by traditional conventional cupolas. Developments like hot blast, oxygen enrichment of blast, oxy-fuel injections etc. were not found suitable for Indian conditions whereas Divided Blast Cupola (DBC) was found favourable. The most striking and surprising findings are the very poor thermal efficiency of (25%) and very high carbon print (1450 Kg CO_2 per ton) of induction furnace against 60% thermal efficiency and 350 Kg CO_2 per ton for Divided Blast Cupola. (This is because theoretically based on Carnot cycle, thermal efficiency cannot be more than 39% for converting thermal energy to mechanical power and then to electricity in thermal power plants which gives a final efficiency of 25% considering 60-65% efficiency of the furnace itself). In case of cupola melting the charge comes directly in contact with the hot gasses and heat transfer to melt the charge, thus giving a higher thermal efficiency of 60%.

Direct comparison of carbon foot print of large scale foundry operations using cupola or induction furnace is 1.16 & 2.86 tons of CO_2 produced per ton of castings respectively. Induction melting foundry produces more than two and a half times CO2 than a cupola foundry for same production.

'Therefore we should not hesitate in saying that cupola melting is far far better than induction furnace from both points of views, energy conservation and global warming'(5) In fact the cupola is contributing to more than 70% of world CI/SG production.

Carbon Credits: The carbon foot print reduction should give carbon credit benefit under the CDM (clean development mechanism) of UNFCC to the foundries. A foundry of 1000 tons /month can think of getting CRR's worth Rs.30 lacs annually for using DBC/ cokeless cupola in place of Induction Furnaces.

"These induction furnaces became popular decades back when dirt cheap stainless scrap disappeared from the western markets and these furnaces switched over to steel production of second quality

for mini rolling mills etc and multiplied in numbers to include CI melting. And our casting users mistakenly degraded the cupola to poor old dirty technology incapable of producing automobile quality castings. The times have changed but we have not moved with time in this regard".

The author in his conclusion ranked melting furnaces in Indian context as:

Table 3

Rank	Furnace	Energy Efficiency	Economy Rs./ton	Eco Friendly kg CO_2/ton
1st	D.B.Cupola	55-58%	1800-1900	300
2nd	Duplexing (combination of DBC + Induction Furnace)	80-90%	3000-3400	180
3rd	Induction Furnace	25%	3200	1450

He suggested that Small foundries must modify/replace their cupolas to DBC and start duplexing in small induction furnaces to improve quality and reduce rejections to save further cost. Medium scale foundries being set up should install requisite numbers of cupolas with induction for duplexing. Large foundries must expand by installing requisite number of cupolas to duplex in existing induction furnaces.

IV. CONCLUSION

On the basis of this research we can conclude that, Cupola is the oldest and primary method for melting of Cast Iron but with the introduction of induction furnace and it being clean, energy efficient and well controlled melting process replaced cupolas. On imposition of severe restrictions on power consumption, load shedding time limits forced foundries to turn back to coke based cupolas while meeting environmental norms. In the current scenario duplex foundries are preferred where the melting is done in Cupola Furnaces and then the molten metal is duplexed in a induction furnace for cleaner melting, ease of composition control, improving quality and reducing rejections. Finally we articulate that Cupolas have found favour again and have become indispensible in modern foundries. Today, India is the 2nd largest producer of castings in the world and that 35% of C.I. Castings are produced by traditional conventional cupolas.

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Online Buspass and Ticket Generation System with Qr Code

Aakansha Gupta, Beenash Iram, Bharti Samrit, Monika Dhage, Prof. Nazish Khan
Department of Computer Science and Engineering, Sadar Nagpur, Maharashtra, India

ABSTRACT

The aim of this project is to provide online facility of bus pass and tickets system to the daily commuters of Nagpur city. It uses database to store data about passenger, bus, ticket and bus pass. This project has two logins, one for user and another for admin. In this project ticket reservation and bus pass creation as well as renewal system has been provided. It is a web application for people who want to book ticket and get bus pass online. It is very useful as it reduces pressure of manual work. This system was intended to develop a web application to perform functions like accessing data of users for authentication and provide pass to particular commuter. This system is helpful for people to get a pass in time as user don't need to wait in a queue for his/her turn. User can get a pass from our system anytime. The OTP (one time password) will be generated for every user while registering for the first time which will be sent to his email id. The notification will be sent to user's email id which will be generated before the pass expires. This is beneficial for every passenger to get pass in time.
Keywords: passenger, notification, authentication, registration.

I. INTRODUCTION

This online Bus Pass and Ticket Generation System is a constant project which will be helpful for those everyday commuters of Nagpur city who are dealing with troubles of these day's manual system of generation of bus passes. Due to rapid growth in technology people need to upgrade themselves to current fashions and our upcoming ages are searching forward for essential administrations in a single touch. This project is created to provide effective, cheap, reliable, timesaving, efficient and comfortable services for people of Nagpur city. The large crowd causes long waiting instances to apply for the bus passes and collecting them. Bus pass generation would be useful to implement legitimate and better rates for passes and furthermore it would be valuable for travelers who forget to carry their bus passes with them while travelling. Handling tickets in a bus is a tedious task now-a-days. Giving precise change for tickets to an expansive group is likewise a dull procedure for conductors in the buses. The current system of taking tickets for larger crowd leads to stop the bus for long time and this delay annoys the employees as they have to reach their work place earlier. This system proposes a facility to take bus tickets and bus passes using android mobile application. This system provides a facility by which the user can book the ticket via online transaction. This system also reminds the user that bus pass is about to expire. It can be used to apply/renew the bus pass through smart phone which helps all generation people. This system establishes a connection between users and admin.

Data is managed in android app, which facilitate GUI for the user.

II. PROBLEM DEFINITION

It is a manual process in which students and other commuters are required to submit application forms along with their details filled. These application forms are to be verified and then the bus pass is issued to the concerned person after the application form is verified. This is a time consuming job, that involves people to wait in prolonged line to obtain their passes. This causes in a great amount of time wastage for the passengers. Also, the bus pass issue takes place in the current system, only for a limited period of time during the day that is until evening. This gives the literature survey of the bus pass issue system across the Indian states. The existing online bus pass systems needs the passengers and students to fulfill the necessary details by going in the specific bus depots. Once the documents are submitted, it would be verified by the officials present at the depots. Because of this, an ample amount of time is wasted for the commuters as they have to go to the bus depots for confirmation of tickets. Once the verification is done, the bus pass would be issued on a specified date as communicated to the user. This is a quite difficult job for the consumer to go frequently in bus depots just for the purpose to gain their passes.

III. PROPOSED SYSTEM

It has got the following features: This system will make sure that data is accurate. Records will be efficiently and accurately stored and maintained in a DBMS. Renewal can also be done online with the reference identification that is provided after the registration is done by the user. If the student or commuters is not interested to use the services of

bus pass then he/she can drop their booking. Minimum time would be required for processing the details submitted and to generate the bus pass. Passenger can purchase the bus ticket through the Internet, with the help of this the tickets confirmation is secured. Other than this, the online system helps the commuters to inspect the availability of the bus ticket before consumer can purchase the bus ticket. In addition to this, customers has to pay the amount of their required tickets via online and do not need to pay via cash. Hence, there is a need of reformation of the system with more advantages and flexibility. The Bus pass booking System reduces the manual work. Bus pass system provides bus pass generation, bus pass renewal, ticket booking and payment is done via online transaction, etc. Using this bus pass system we can inspect all necessary details equivalent Bus pass tickets and it provides the guidelines to the customers like how to renew pass how to update it. This system handles every details of Bus pass. Passengers first need to verify themselves by providing the necessary details. Once the user is verified by the admin/system then it allows users to book passes for any route via online.

IV. REVIEW OF LITERATURE

"Cloud Based Bus Pass System Using Internet of Things", The Cloud based Bus Pass System Project is a real time project which is useful for the commuters who are facing problems with the current manual work of bus pass system. It makes the passenger easy to travel with the ticket QR code with the mobile. So that even if the passenger loses the ticket at the time of checking he can show the QR code. The TTE can check the QR code with the Admin weather it matches or not. The unique number allotted for one person cannot be the same for the other. It also increases the validity period,

frequently warns to the commuters before completion of his/her pass validity period by sending SMS or mails. His/her pass Renewal or Registration can be done using a credit card/debit card. Initially, commuters need to register with the application by submitting details like photo, address proof and other details and submit it online. They will verify your details and if they are valid they will approve bus pass else they will reject. You can even renew using credit card or otherwise transaction methods. [1]

"SBIS urban -Secure Urban Bus Information System based on Smart Devices", Bus Information System (BIS) has been developed for networking passengers with bus companies that provides public transportation services. The BIS, also denoted as BIS generalized, supports a passenger with personalized and real time bus information services in all phases of a journey. Today's BIS generalized encompasses multiple technologies, including advanced visual displays, public address, emergency intercommunications, digital surveillance systems, IP networks, wireless networks, video streaming, coders, decoders and many more. These systems deliver real time bus information seamlessly on vehicles and in stations, while they are controlled and managed from a single control center. However, lots of small bus companies' services like urban city's bus company or small organization's bus could not afford to operate the profound services to the passenger due to the budget of the city, which requires complicated infrastructure. To provide the BIS services with cheap cost, this paper proposes a secure urban BIS, denoted by SBIS urban, based on smart devices and explains the security issues related to the system operation. The SBIS urban is to reduce the cost and to ensure security and privacy from the BIS generalized. The SBIS urban is secure from various attacks, provides privacy and has good properties compared with the other systems. [2]

"A Mobile Application for Bus Information System and Location Tracking using Client-Server Technology", Android is the latest and a rapid growing technology available for all the users or customers in today's market. An enormous increase in the end user acceptance has been experienced in the past few years. This project has been developed on the Bus Information System in Pune. This paper proposes an Android mobile phone application that gives information about buses, bus numbers as well as bus routes – both online and offline. Reason for Android platform - Android requires an open source development which is probably the most feasible and a present user friendly approach. This paper also deals with Location Based Services, which are used to track the current location of the bus as well as give an estimate remaining time for the tracked bus to reach its destination using the Client-Server technology. Also, it displays the required maps with the help of GPS. [3]

"Security Augmenting Scheme for Bus Information System based on Smart Phone", Bus information system is one of most useful information system these days. This bus information system can be implemented with smartphone APP easily and conveniently without big cost. This BIS system, however, has a weak point that the location information of the bus can be revised easily. For the purpose of augmenting the security aspect of the proposed BIS service, this paper explores the security aspect of the bus information system. [4]

"Bus information system based on smart-phone Apps", this paper provides Bus Information System (BIS) implementation based on the Smart-phone APPs using GPS information. Nearly all of recent smart-phones are equipped with the GPS feature.

Bus driver's smart-phone can send the position information using its GPS information periodically and on events. On receiving those information, servers can process those into the information that can be used by individual users and bus stop information panel. The proposed BIS based on smart-phone APPs is expected to be used publicly with the special process that enables the smart-phone APPs only in the specific bus. [5]

"Implementation of Real Time Bus Monitoring and Passenger Information System", this paper focuses on the implementation of a Real Time Passenger Information (RTPI) system, by installing GPS devices on city buses. The Real Time Bus Monitoring and Passenger Information system is a standalone system designed to display the real-time location(s) of the buses in city. This research will enable the tracking devices to obtain GPS data of the bus locations, which it will then transfer it to centralized control unit and depict it by activating symbolic representation of buses in the approximate geographic positions on the route map. Specific software(s) will be used to interface the data received to the map. [6]

"Real Time Passenger Information System", this paper provides means by which the transport industry can develop innovative near-term solutions to meet demands placed on it. The main objectives of this design paper are: (1) RTPIS display at bus stops – showing time of arrival of buses in real time. (2) Web based interface for admin control room to monitor buses in real time. (3) RTPIS display in the bus-showing next and previous bus stops, time to reach destination, advertisement based on location. (4) Future scope of designing mobile application for home users to find out bus schedules and RTPIS.[7]

V. SYSTEM FLOW CHART
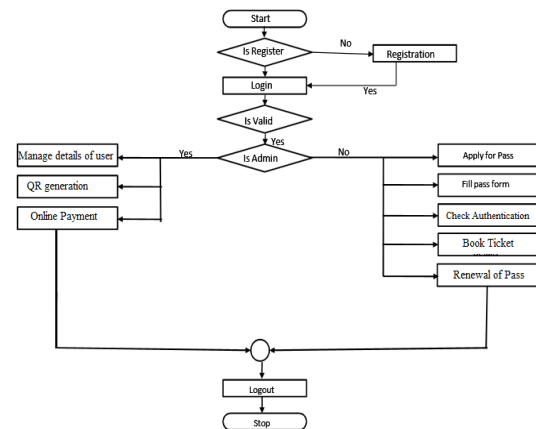
Figure 1

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Prototype Multipurpose Agri Robot

Md. Rahil Farooqui[1], Shruti Chauragade[1], Rasika Dharpure[1], Juhi Gharde[1], Ratanadeep Patil[1], Shaziya Tabassum[1], Prof. Sheikh M. Nawaz[2]

[1]Ug Scholar, Department Of Electrical Engineering, Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

[2]Assistant Professor, Department Of Electrical Engineering, Anjuman College of Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

In India nearly 70% of population depends on agriculture, so there is need to do certain research and development in this sector so that existing resources can be used to their maximum extent. Current generation do not have skilled man power particularly to work in agricultural sector. It becomes the need of today to automate the agricultural sector. So we tried to develop a multipurpose agricultural robot. The essential feature of this robot is that it is multitasking and it takes its energy from solar panel. This paper aims at explaining the interfacing of solar panel, sensors and relay circuits.

Keywords: Mechanization, Robot, Fertilizer, Solar panel.

I. INTRODUCTION

Automation in agricultural sector is not a very new thought. Many of problems faced by the Indian farmers are lack of availability of skilled persons, lack of resources, wastage of money in terms of wastage of pesticides and fertilizers etc. So there is a need to optimize resources. And hence to overcome these problems there is need of automation in agriculture. Automation in agriculture could help in reducing farmer efforts and man power. Many researchers have developed plant cutter, grass cutter, pesticides sprayer, etc. But all these functions are not yet being performed using a single robot. We have tried to fabricate a single robot which can perform multiple task.

II. METHODOLOGY

The basic aim of the project is to fabricate the multipurpose robot which is used for plant cutting, grass cutting, pesticide spraying, insect killing, birds scaring. The robot is powered by a 12V battery which is charged through 10W solar panel.

➢ The base frame is of stainless steel of dimension 22 x 18 inch. With 3 wheels are connected which are driven by the DC motor.

➢ Solar panel is mounted on the top of the frame and it is connected to the 12V battery through charge controller.

- ➢ Two blades for plant cutting are mounted on the front corners of the frame.
- ➢ One blade for the grass cutting is placed to the bottom side.
- ➢ Sprayer is mounted on vertical rod for pesticide spraying with help of nozzle.
- ➢ Blue colour LED and IR sensor is placed on one corner. Whenever insects will come near the light sensor will gives a signal to the pump and the pump will spray particular amount of insecticide over the insects.
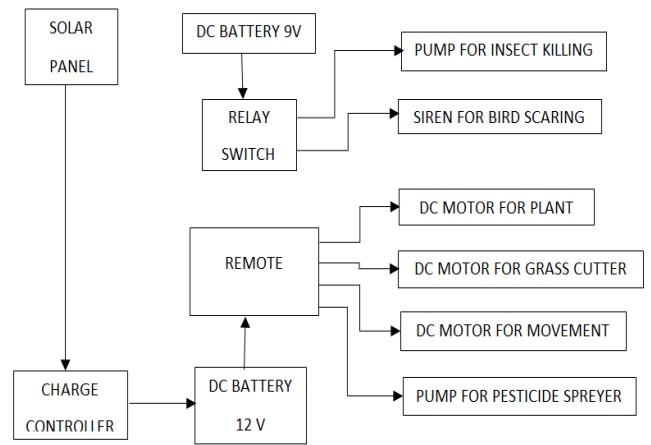
Figure 1. Block diagram of proposed system

Table 1 . Components List

SR NO.	COMPONENT	QUANTITY	SPECIFICATION
1	Solar panel	1	12V 0.63A 10W
2	Charge controller	1	12V 1A
3	Battery	2	12V 8Ah
4	DC gear motor	2	12V 198 mA
		3	12V 77mA
5	Pump	1	12V 2.6A 31.2W 3.6LPM
		1	12V 1.5A 18W 2LPM
6	Siren	1	12V 4.1A 50W 150dB
7	Sensor	1	9V 100mA 3-4 feet sensing range
8	Relay	2	9V

III. OPERATIONS

PESTICIDES SPRAYER:

The use of the pesticides should be as efficient as possible to minimize their release into environment. Pesticide sprayer consist of a tank, pump and a nozzle which is mounted on a vertical rod on front side of the frame. Pesticide is forced though nozzle by pump of 12V, 2.6 Amp having discharge rate of 3.6 lit/min. The size of droplets can be altered by using different nozzle sizes or by altering the pressure under which it is forced or combination of both.

Figure 2. sprayer

INSECT KILLING:

The use of insecticides is believed to be one of the Major factors behind the increase in agricultural productivity. For good insect control you must learn how to use insecticides (chemicals) effectively. There is one IR sensor and blue coloured LED light separated by a small distance. Whenever insects will come near the light, sensor will give signal to pump and the pump will spray particular amount of insecticide over the insects.

Figure 3. Insect killing pump

BIRD SCARING:

One of the oldest design of bird scarer is the scarecrow in the shape of human figure. This method is not working so efficiently. In our model one proximity sensor will be mounted on the frame, whenever a bird will come into its range, sensor will give signal to buzzer. The buzzer generates a loud blast that scares birds at a long distance.

Figure 4. Siren, IR Sensor

PLANT CUTTER:

Plant cutter will be mounted on front side of the two corners. These plant cutter will be operated by two DC gear motors and will cut the plants .It uses fine blades mounted on both sides of robot. These blade operates by DC gear motors of approximately 1000 rpm, which are supplied by 12V dc battery.

Figure 5. Plant cutter

GRASS CUTTER:

Grass cutter will be mounted on the bottom side of the frame. This plant cutter will be operated by the

DC gear motor and it will cut the grass. These blade operates by a DC gear motor of approximately 1000 rpm, which is supplied by 12V dc battery.

Figure 6. Grass cutter

IV. SCOPE

The main aim of our project to develop a solar operated agricultural robot for plant cutting, grass cutting, pesticide spraying, insect killing and bird scaring. This project is powered by a solar panel which absorbs UV rays from sun and converts it into electrical energy. Solar energy is the renewable source of energy and it is non pollutant. As we know the fossil fuel may deplete in near future on the other hand solar energy will be remain available all the time and that too totally free of cost. This robot would be very useful in near future as far as increasing rate of pollution is concern. At the same time following modifications can be done to make this robot more convenient.

- ✓ Robot can be made fully automated with the use of sensors and micro controller which are able to detect obstacles, crops and weeds.
- ✓ It can also be made to operate under remote control.
- ✓ With some modifications robot can perform few more operations like seed sowing,

weeding, digging, fruit picking, can also be performed

- ✓ The size of the robot can be suitably reduced to the optimum size which can be used for weeding in between the crops like ground nuts, sun flower and other vegetable cultivation.

ADVANTAGES

- ➢ Helps to reduce the human labour and saves time.
- ➢ Pollution free.
- ➢ Portable in size.
- ➢ Maintenance is less.
- ➢ Single machine can perform multiple task.
- ➢ Pesticide and insecticides are used in optimized manner.
- ➢ Skilled manpower is not required.

DISADVANTAGES

- ➢ Initial cost is high.
- ➢ Alternate source of energy is required when solar energy is not available i.e. in rainy season.

V. CONCLUSION

We want to conclude from the review of the papers that there is need of automation in the agricultural sector to enhance the productivity and reduce the human labour. Automation also reduces the saves the time. In future this robot can be enhanced with some more capabilities and to take appropriate action even in the absence of farmers.

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Iot Based Farm and Monitoring System

Zainab Jouhar*, Ayeman Khan, Piyali Narnaware, Prachi Thombre

Computer science engineering, Anjuman college of engg & technology, RTMNU, Nagpur, Maharashtra, India

ABSTRACT

In India the involvement of technology in agriculture is not been facilitated by the farmers, so to improve this perception towards technology this project has been put forward. The objective is to hike up the use of internet to reduce all the man power required and to inculcate the usage of e- agriculture in farming process.in addition, involvement of different types of sensors make our project more user friendly. IoT is a network device which connects all the electronic devices that are capable of holding and exchanging data. IoT enables remote access to the physical world from computer based world hence leading to reduce manual interface. It also help in increasing efficiency since it can preserve previous data as history. For minimizing physical work and extraneous stress on farmers we are adopting the technology called IoT, which would serve the need of agriculture for farmers. Irrespective of the location, the connected devices can be viewed and operated online. The use of moisture sensor and the temperature sensor are one of the connected devices, that would help user know the condition of the soil and also these conditions would be stored in the database. Involvement of GSM would send an alert message to the user during the scarcity situation.

Keywords: IOT, farm-monitoring, GSM, sensors.

I. INTRODUCTION

As there is a constant enhancement in the technology the incorporation of the same in every field is more promoted. In agricultural domain the involvement to this technology may help in improving the efficiency and the outcomes.

Few system and researches have been put forward for monitoring and managing of the agricultural courses .The intent of our design is to administer both the monitoring as well as the management process of the field. This system comprises of distinct sensors which would calculate the soil status, hence improving the management technique. The temperature sensor, water level sensors and moisture sensors are the sensors involved which would measure the water content therefore indicating whether the soil is wet or dry.

Along with measuring the temperature of the soil .These measurement can be viewed online by the user and would be store in the directory for easy future access.

In some cases there may be a situation arises where a motor is on irrespective of the water content of the well , if it is below the mark then alert message through GSM can be send to the user .

II. PROPOSED PLAN

- ✓ The process of utilizing technology in farming and cultivation require deep knowledge of agriculture process. In order to design and build a precision agriculture that can be widely used by many users and applied in different context.

- ✓ Designing such a system to improve the state of agriculture that can be used in multiple context is a challenging task and it is too complex of a problem to address in such a broad perspective.

- ✓ this farm monitoring and management system proposed mainly helps in minimising the human involvement in agricultural

Figure 1. A sample line flow diagram showing all the connections.

A. DC water pump -DC water pump is a device that helps in moving fluids and slurries by mechanical action.

B. Temperature sensor - temperature sensor is a device that helps in measuring the temperature through electrical signals.

C. Soil sensor- soil sensor helps in measuring the volumetric content of the soil.

D. GSM- GSM is a mobile communication and it helps in digital cellular.

E. Arduino - Arduino is a open source company that designs and manufactures single board microcontrollers, kits for building digital devices that can sense and control objects from real world.

F. Battery – battery is a device which helps in providing power to the electrical devices.

E. Ethernet – Ethernet is a interface which is used for connecting multiple electronic devices together.

III. WORKING

Figure 2. hardware connections

A. It generate the modern agriculture which is highly knowledge intensive which also requires timely, reliable and accurate information on natural resource endowments.

B. It consists of two detection systems one monitoring and another warning system.

C. Signal send to the controller by sensors, accordingly, the information about the land is updated in the Microcontroller.

D. In case of emergency alert SMS can be passed by GSM and current information are viewed through internet database by using internet.

E. In case of emergency automatic motor has been OFF if the water level is decreased and SMS will send.

IV. RESULTS AND DISCUSSION

By using internet of things majority of farmers were aware about the monitoring and warning detection method in agriculture along with managing the same at the same time. This will facilitate the e-agriculture to accessing the performance of the farmer doing independently. It enables to provide the alert messages and statistical survey report to the farmers by irrespective of location. This study is to provide great potential for improving decision making in agriculture. From this report it extend the agriculture organisation ability to meet the need of its farmers.

V. CONCLUSION

This farm monitoring and management system might prove to reduce the physical work along with a widespread of awareness of the usage of e-agriculture hence improving the performance of the crop yield.

Also, the involvement of gsm in this project enables the farmer to know the crop condition from any location along with an alert message notification during extremes. The use of sensors also enhances this project as they can store the data recorded as the readings in the database which can be accessed as and when required by the user hence making it more user friendly .this prior stored database would help the farmer improve his decision making in agriculture.

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Advanced Hybrid Turbine Structure for Efficient Power Generation

Samiullah Khan, Owaiss Ansari, Shahrukh Raheman, Sayed Hamed Hussain, Firdous Ahmed Khan, Shamama Naaz, Prof. Nahid Khan

Eletrical Engineering,RTMNU/Anjuman College Of Engineering And Technology Sadar, Nagpur, Maharashtra, India

ABSTRACT

As per the technical evolution and latest trends taken into consideration, we have effectively created a Advanced Hybrid Savonius Muli-Station Structure Inverter for Industrial and Home Application. This project uses a savonius structure which is very advanced and having efficiency greater that other turbines also this structure able to rotate multiple generators so that we can able to handle multiple power stations.vertical-axis wind turbine (VAWT), used for converting the force of the wind into torque on a rotating shaft. The turbine consists of a number of aerofoils, usually—but not always—vertically mounted on a rotating shaft or framework, either ground stationed or tethered in airborne systems. Now a day's power requirement is the biggest demand in the growing world. Since last decade we are using multiple turbines structure so accordingly we have succeed to move only one generator and one station but this structure succeed to rotate multiple generators. This project uses a axial wheel structure which is very advanced and having efficiency greater that other turbines also this structure able to rotate multiple generators so that we can able to handle multiple power stations. Savonius wind turbines are a type of vertical-axis wind turbine (VAWT), used for converting the force of the wind into torque on a rotating shaft. Now a day's power requirement is the biggest demand in the growing world. Since last decade we are using multiple turbines structure to move only one generator and one station but this structure succeed to rotate multiple generators and according having capability to move multiple stations.

I. INTRODUCTION

As per the technical evolution and technical trends taken into consideration so we have created a "Advanced Hybrid axial wheel structure and arm gear based effective Mechanical Structure for Multi-Station Optimized Power Generation. This system uses an advanced axial wheel structure hybrid turbine which will rotate over multiple natural resources water force, wind power and related things having efficiency greater than aerodynamic turbine. The advancement of this turbine is that, this turbine rotate over different natural resources. The advantages of this project as compared to other system is that, on one single axial wheel structure unit we can able to rotate multiple power substation and other power station uses single turbine which will rotate only single generator. So power output is more efficient than that normal. This project we can able to implement

at industries, factories, agricultural areas, home, airport, hill station and artificial creations.

This is not a simple structure like simple turbine. This is advanced technical structure ie axial wheel structure created specially taken vision over multiple natural resources.

Axial wheel wind turbines are a type of vertical-axis wind turbine (VAWT), used for converting the force of the wind into torque on a rotating shaft. Now a day's power requirement is the biggest demand in the growing world

II. CONCEPT

In this project with the help of natural available resources i.e. non-conventional energy source water, air, Water mud, stones and grains and using gravitation force here created a mechanism i.e. advanced turbine rotates.

With the movement of this turbine accordingly main arm will rotate. There is coupling between Turbine and main arm so that we can replace this turbine efficiently without affecting the other system.

Main arm having 2 different mechanisms coupled with this and according to force transfer, within single rotation of turbine the arm and mechanism rotates no. of times

According to force transfer, within single rotation of turbine the main arm and mechanism rotates no. of times and with the single rotation of main arm sub arm rotates no of tines and finally with the single rotation of sub arm generator rotates no of times so effectively force transfer from Turbine to generator.

That means within limited availability of Renewable or non-conventional energy source and with minimum rotation of turbine the generator rotates no of times which is the advantage of this system

Block diagram
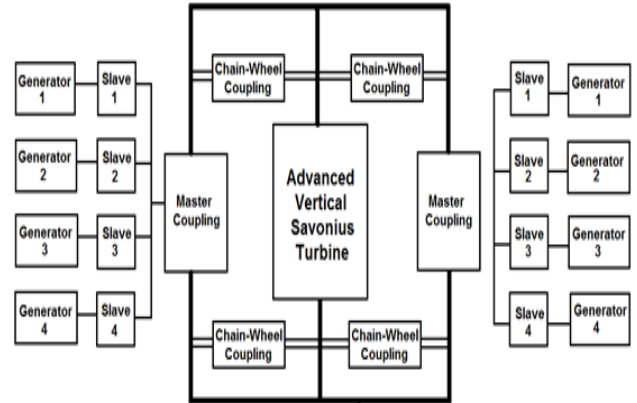
This structure having natural resources settlement and re-utilization capacity, that means this structure not only uses multiple resources i.e. wind power, water force and other but also settle them to reutilization so that this turbine rotate with more toque and able to create more output so that we can able to charge battery within minimum time.

This Project Consists of 4 different Units:

1. Savonius Unit/axial wheel.
2. Main Arm.
3. Sub ArmMulti-station
4. Generator Unit
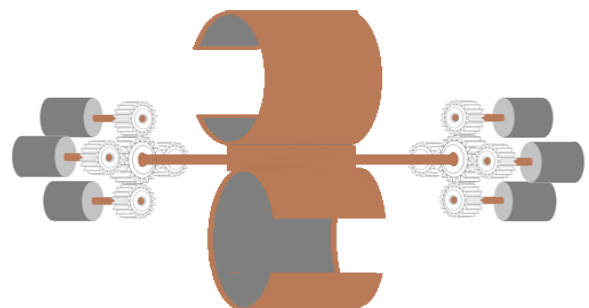
Main Savonius Assembly
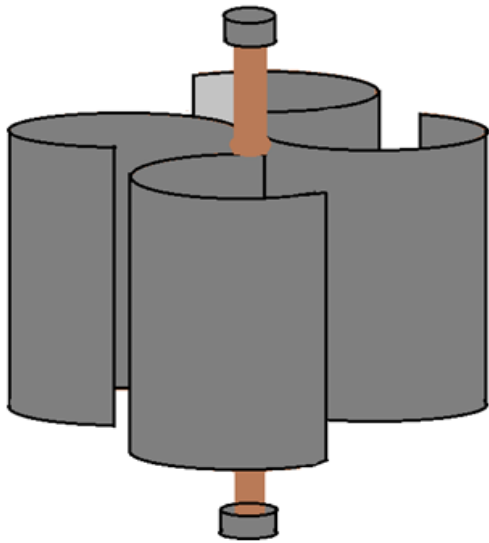
Savonius Unit/axial wheel turbine
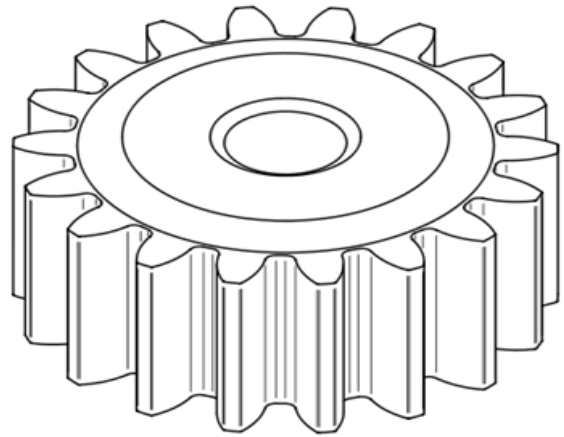
Main Arm
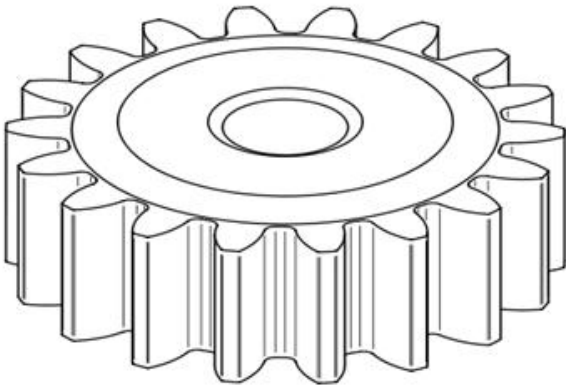
Sub arm

DC generator

Table 1. Component used

Components	quantity	Material Used
Panels	4	Chromium Coated Sheet
Savonius Panel	1	Chromium Coated Sheet and Mild Steel
Solid ROD	1	Mild Steel
SUB Arm	8	Mild Steel
Main ARM	2	Mild Steel
Generator Carrier	8	Mild Steel
Generators	8	Copper winding and Magnet
Support Angles	6	Iron
Grub Screw	32	Mild Steel

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Simulation and Controller Design of an Interline Power Flow Controller in MATLAB

Saurabh Bodele, Mohammad Aamir, Pratik Raut, Shivam Nasre, Aarti Rao, Sneha Ladse, Prof.Pramod gadge, Prof.Yasmin Sayeed

Electrical and Power, RTMNU, ACET, Nagpur, Maharashtra, India

ABSTRACT

An Interline Power Flow Controller (IPFC) is basically a FACTS controller which finds its utility in series compensation supplemented with power flow control within the transmission line. It contains a minimum two Voltage Source Converters (VSCs) with a common dc-link. In this work we propose to develop a control scheme of an IPFC system with two VSCs to compensate the impedances of two similarly dimensioned parallel transmission lines . The model is simulated using MATLAB Simulink to demonstrate the system behavior of the IPFC.

Keywords : FACTS controller, Interline Power Flow Controller, MATLAB Simulink, STATCOM, SSSC

I. INTRODUCTION

Voltage or Current Source convertor based Flexible AC Transmission Systems (FACTS can be used to control steady-state as well as dynamic/transient performance of the power system. Such Converter-based FACTS controllers provide an advantage of generating/absorbing reactive power without the use of ac capacitors and reactors supplemented with control of active and reactive power flow in the system[1].

Series connected converter-based FACTS controllers include Static Synchronous Series Compensator (SSSC), Unified Power Flow Controller (UPFC), and Interline Power Flow Controller (IPFC). A SSSC is a series compensator with ability to operate in capacitive/inductive modes to improve system stability [3,4]. The UPFC includes a Static Synchronous compensator (STATCOM) and a SSSC that share a common dc-link.

The IPFC consists of two or more SSSC with a common dc-link. They provide independent control of reactive power of each individual line, while active power could be transferred via the dc-link between the compensated lines and can also be used to equalize active/ reactive power between transmission lines.

This paper presents models of the IPFC which are based on [1,2]. In section II the methodology is discussed followed by the control scheme in section III. Section IV presents the results.

II. METHODOLOGY

A. Power Circuit

An IPFC (Figure 1) uses two or more VSCs that share a common dc-link. Each VSC injects a voltage

- with controllable amplitude and phase angle - into the power transmission line through a coupling transformer. Each VSC provides series reactive power compensation for an individual line and it can also supply/absorb active power to/from the common dc-link.

Thus, an IPFC has an additional degree of freedom to control active power flow in the power system when compared to a traditional compensator. This capability makes it possible to transfer power from over- to under-loaded lines, reduce the line resistive voltage drop, and improve the stability of the power system. The coupling transformer primary windings of the master and slave converters are star-connected while their secondary

windings are connected in series with each phase of the transmission line. In addition, the transformer leakage reactance allows regulation of the output voltage magnitude and phase angle, with respect to the transmission line current, and offers stable control of the VSC power output.

Figure 1 shows the scheme of an IPFC having two VSCs. In this scheme, a master control system is used to compensate both resistive and inductive impedances of the Line 1 power system, and the slave control system is used to regulate the reactance of Line 2 and maintain the common dc-link voltage

B. Converter model

The VSC is the fundamental building block of the IPFC. Various types of pulse-width modulation (PWM) or multi-pulse converters i.e. multi-level converters, are feasible for power conversion.

Irrespective of the VSC topology, a large number of switches must be connected in series to provide the

required valve voltage rating. Therefore, appropriate snubber circuits are used to minimize the switching stresses on each device.
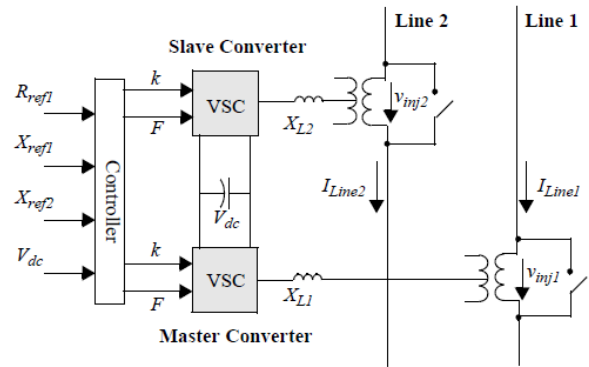
Figure 1. Schematic of an IPFC

We propose to use 3-level Neutral Point Clamped (NPC) PWM VSC. This topology is suitable for high power applications and, when compared to a 2-level topology, it produces fewer harmonics, has smaller dc capacitors, lower switch blocking voltages and lower switching losses.The drawbacks, however, of the 3-level NPC topology are: requirement for a large number of switches, different duties for semiconductors switches and a requirement for balancing the dc capacitor voltages. For the converter model, a 3-phase 3-level NPC VSC with a switching frequency of 900 Hz is used. Each converter consists of 12 valves and 2 dc capacitors C1 and C2. Each valve consists of a switch with turn-off capability and an anti-parallel diode.

The diodes ensure bi-directional current flow and, therefore, the converter can operate in either rectifier or inverter modes.

The switch model consists of two snubber circuits to limit dv/dt and di/dt in the VSC switches.
If the VSC losses are neglected, the injected voltage from the converter can be set to either lead or lag

the transmission line current by exactly 90o, depending upon the requirement of the reactive power.
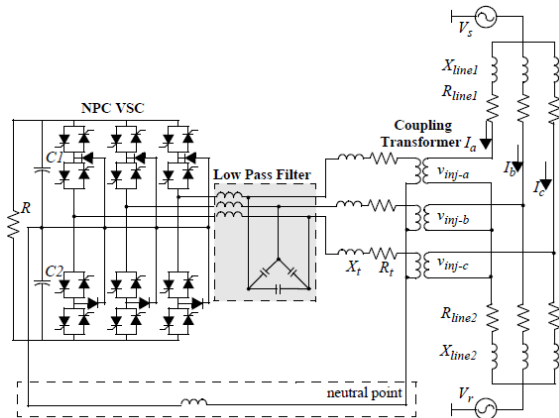
Figure 2. Schematic of 3-level Neutral Point Clamped VSC

The neutral point of the coupling transformer and dclink of the slave system VSC are connected with a large inductor Lo. This path is employed to equalize the dc capacitor voltages of the VSC. However, the master converter system of the IPFC (that regulates the resistive and inductive impedances of the transmission line) has no such connection between the neutral of the coupling transformer and dc-link of the IPFC (Figure 2).

Since the output voltage of the VSC contains high-order harmonic components, low-pass and tuned filters are used to provide a clean sinusoidal waveform in both master/slave systems.

III. CONTROL SCHEME OF IPFC

The IPFC is designed to maintain the impedance characteristic of the two transmission lines. The IPFC consists of two converter systems:
(a) a master converter system that is capable of regulating both resistive and inductive impedances of Line 1; and,
(b) a slave converter system that regulates Line 2 reactance and keeps the common dc-link voltage of

the VSC at a desired level. So, each VSC is independently controllable.

Balancing the dc voltages Vdc1 and Vdc2 on the capacitors C1 and C2 respectively, is an important concern in multi-level converters (Figure 2). Uneven voltage charging on the capacitors can cause over-voltages on the switching devices and that could be destructive for them. The problem may be solved by either
 (a) a modified PWM switching pattern [11],
 (b) by a voltage regulator for each level using an additional charge balancing leg [12],
 or (c) separate dc sources. In order to maintain an equal voltage in the dc-side, the voltage of the neutral point must be regulated.
Here, based on [15], the zero sequence current i0 is used to equalize voltages on the dc-link capacitors of the VSC.

C. Reference Wave Generator (RWG)
The 3-phase transmission line currents are used as the reference signals by the controller to generate either lagging or leading voltages by a 90o phase shift with respect to the transmission line current.
The output reference waves are synchronized continuously with the original input waveforms (that could be distorted or contain harmonics). This method, when compared to a conventional PLL, has a fast response to any distortion and suffers very little transient delay.

D. PWM Block
This block provides the firing pulses for the 3-level VSC switches

E. Balancing Controller
The zero sequence current is used to balance the voltages of the dc-link capacitors in a 3-level Neutral-Point-Clamped (NPC) VSC [15]. This is

achieved by connecting the neutral points of the slave system's coupling transformer and the dc-link of the IPFC through a large inductor Lo (Figure 2).

IV. SIMULATION RESULTS
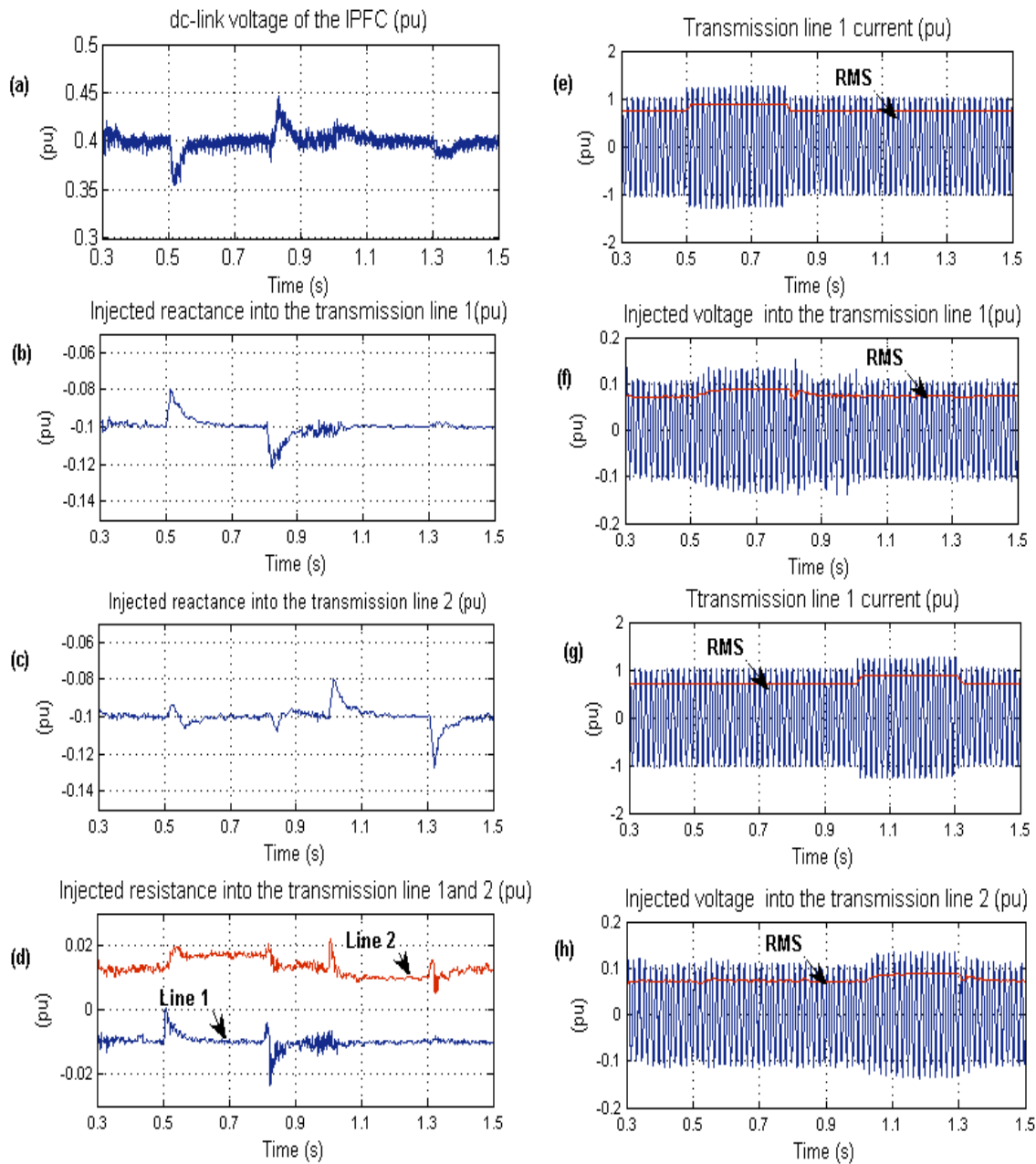
Figure 3. shows the Impact of load variation (a) Dc-link voltage (b) Injected reactance into the Line 1 (c) Injected reactance into the Line 2 (d) Injected resistance into the Lines 1 and 2 (e) Current in Transmission Line 1 (f) Current in Transmission Line 2 (g) Injected voltage into the Line 1 (h) Injected voltage into the Line 2
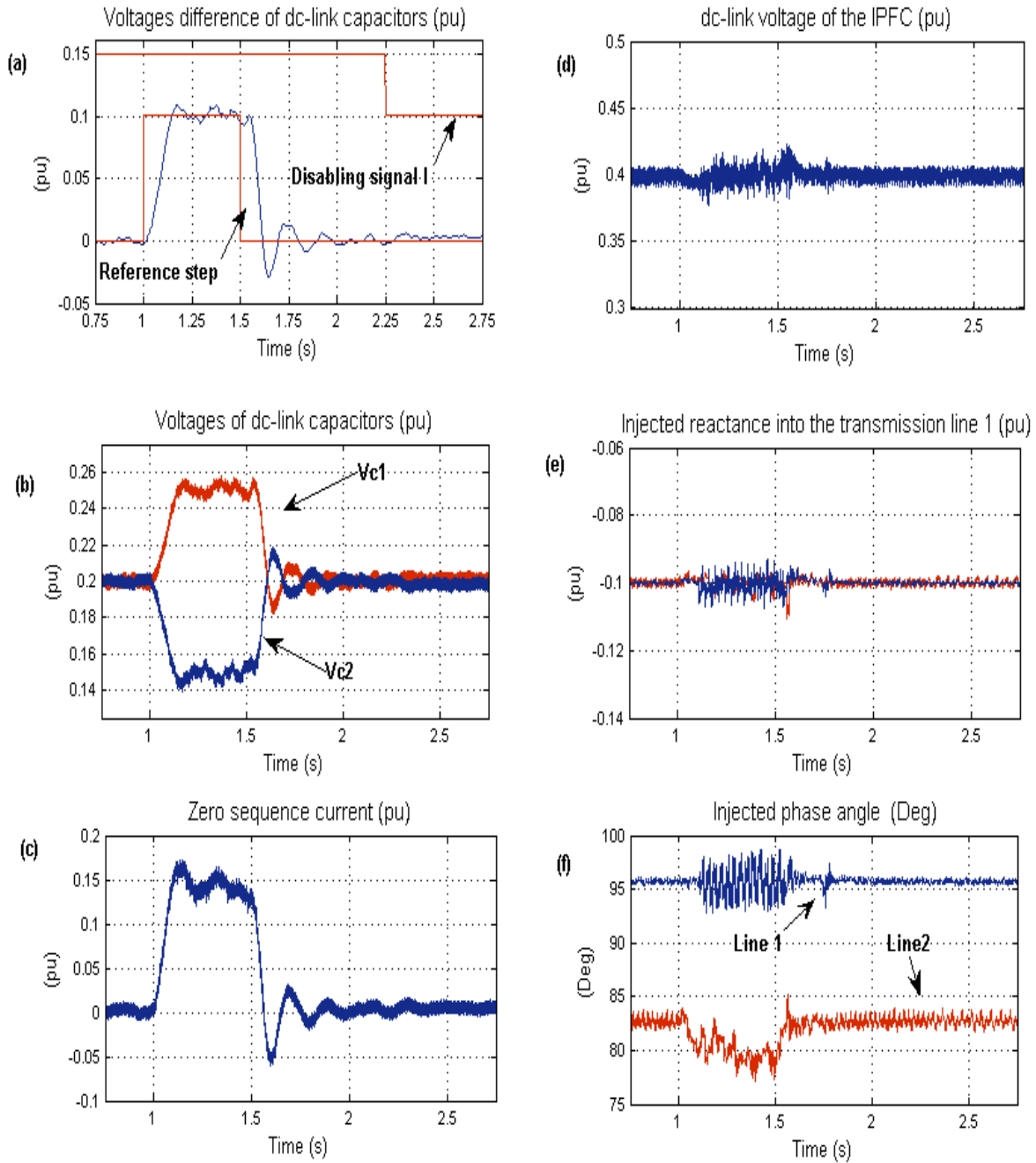
Impact of dc voltage balancing circuit (a) Voltage difference of two dc-link capacitors (b) dc-link voltages *Vdc1* and *Vdc2* (c) Zero sequence current (d) Net dc-link voltage (*Vdc1*+*Vdc2*) (e) Injected reactance into the transmission line (f) Phase angle of injected voltage.

(a) dc-link voltage of the IPFC (pu)

(b) Injected reactance into the transmission line 1(pu)

(c) Injected reactance into the transmission line 2(pu)

(d) Injected resistance into the transmission line 1(pu)

(e) Injected voltage into the transmission line 1(pu)

(f) Injected voltage into the transmission line 2 (pu)

(g) Injected phase angle (Deg)

(h) Transmission line current (pu)
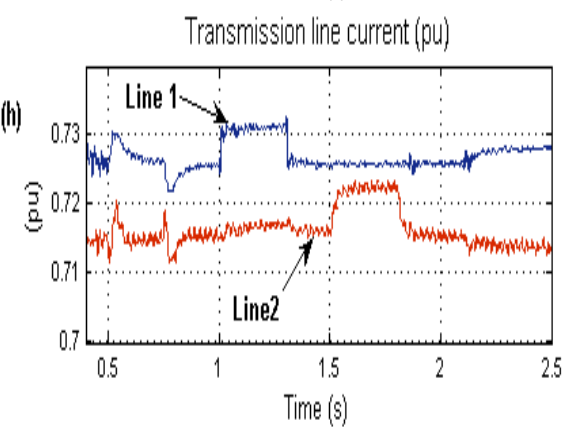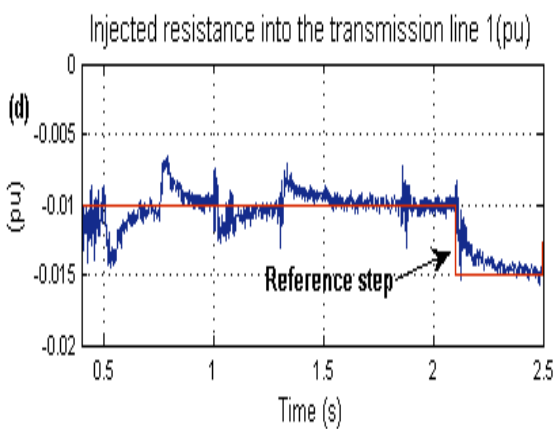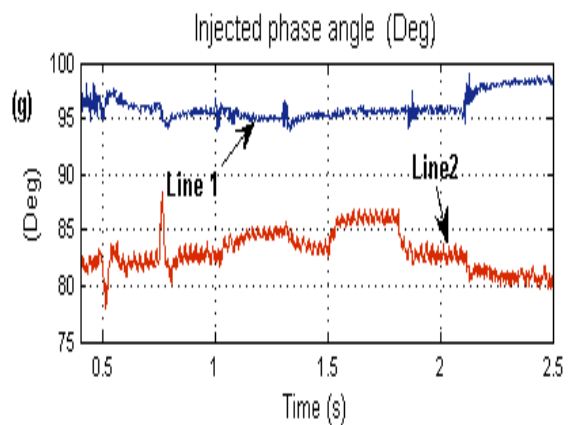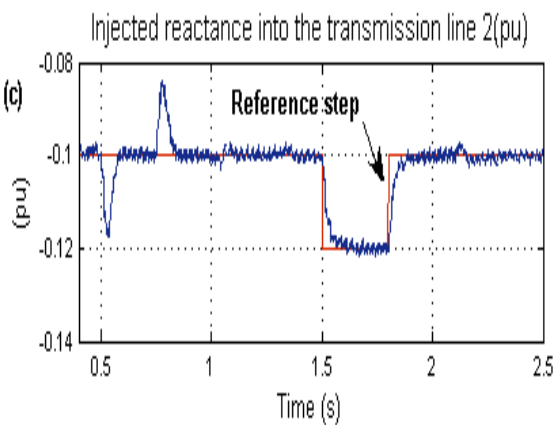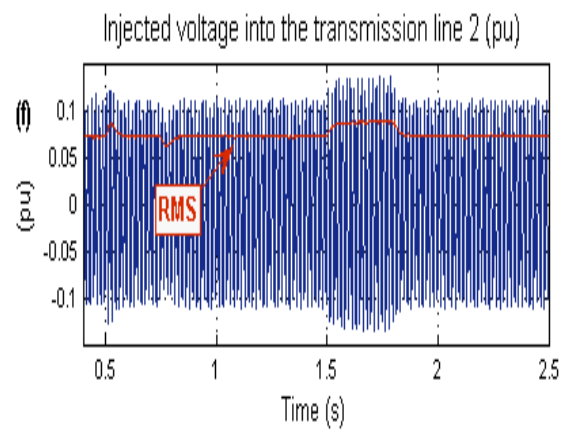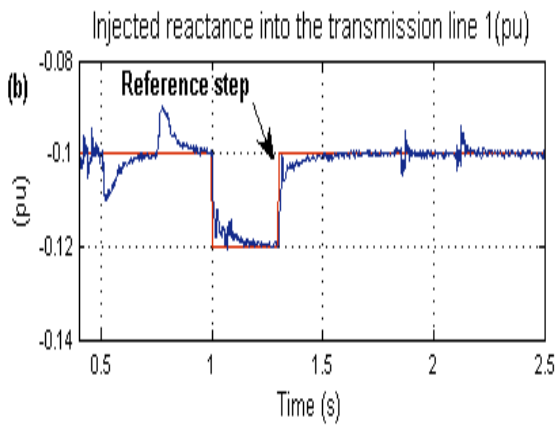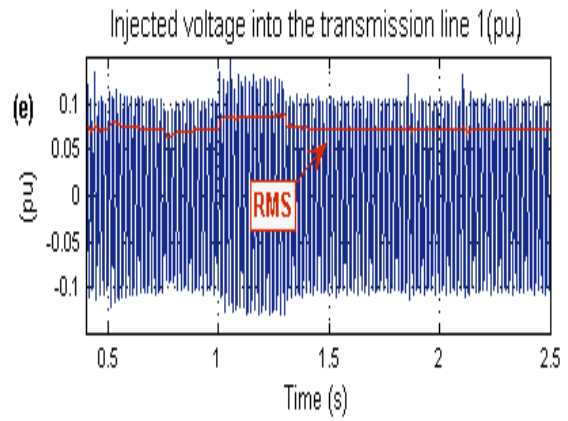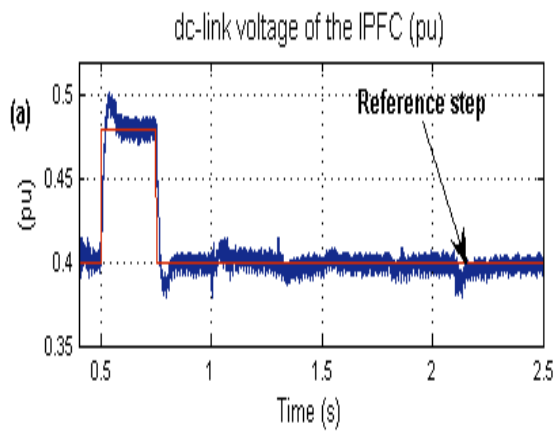
System response to step change of the controller reference values (a) Dc-link voltage (b) Injected reactance into the Line 1 (c) Injected reactance into the Line 2 (d) Injected resistance into the Line 1 (e) Injected voltage into the Line 1 (f) Injected voltage into the Line 2 (g) Phase angle between the injected voltage and the transmission line current (h) Receiving-end reactive power in Line 1 and Line 2.

V. CONCLUSION

We conclude that we will have to develop an IPFC system and will simulate it in MATLAB observe the operation of IPFC.

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Implementation of User Tracking System in Social Networking using Android

Pranita Marjive, Shubhangi Padole, Ruchika Tiwari, Krunal Shinde

Department of Information Technology, RTMNU University, Nagpur, Maharashtra, India

ABSTRACT

This paper aims to present a system that interprets the social nature of a human being need to be always in touch with friends. As there is no society without communication, so there is no person without social interaction. The role of this application is to create a social network in which the user gets a friend's location when he will pin their friends on Google Map through this application. The users have the possibility to check in some locations and allow their friends to follow their activity. This application comes with new facilities in comparison with existing solutions. It is related to the fact that users can share their locations with others (like family, friends, colleagues, etc.). By using GPS, the location is tracked which enables android mobile phone.

Keywords: Social network, Google Map, GPS, Android mobile phone.

I. INTRODUCTION

In today's world, the social network is an essential part of human occurrence. Over time, forms of communication and understanding about this process have been expanded based on technological progress. The desire to use the phone not only to call someone or send and receive SMS has been perceived by Google. As smartphones are providing various unique facilities, day by day more and more people get attracted to them. Thus here, including base possible features and resources has become the need of the day. GPS is one of the resources which offers an outstanding service of getting related locations. GPS analyzes and stores location data from satellites signal and saves it for transmits in real time. The activity such as real-time location (on Google Maps). This application comes with new features in comparison to the existing solutions.

II. OBJECTIVE

The smartphone is the major resources of the present system for speedy and smart activities. So, we are going to develop a system which allows a user to share their location. The main objective of this application is Location Tracking in which User's android phone is tracked and updated in real-time in Google maps.

III. LITERATURE SURVEY

3.1 In Social networking smartphone through a prototype implementation using android.
Authors: Anil Kumar, Prem Mithilesh, Chandra Kiran, Vinay Gautam, S Jaya Kumar
In this paper "Social Networking in Smartphone through a prototype implementation using Android", we are going to introduce and develop a

system which brings user across various corner's together and lets them connect. This paper gives basic concepts about tracking the location of a user using GPS service. The main objective a developing a social network application is to provide an easy accessibility and communication for users in a secure network [1].

3.2 Friend Finder Navigation android application to meet new people around
Authors: Navin D. Waghwani, Ravi Jayaraman, Umesh B. Waghmare

In today's scenario, mobile computing has advanced to such an extent where the user has access to all the information on a single device. Location-based services offer many advantages to the mobile users to retrieve the information about their current location and process that data to get more useful information near to their location. Location-based friend finder is a mobile social networking application that could be used to locate a friend on Google map, share information with each other, create and manage events, create groups with the interest basis. Also, it gives notification to the client displaying the nearby events on his interest basis [2].

3.3 Mobile Tracking Application
Authors: Radhika Kinage, Jyotshna Kumari, Purva Zalke, Meenal Kulkarni

Personal Tracking Systems are the tracking devices specially built up for personal information. The person takes it with him and the information of where he is present is provided. The same system has been implemented in this mobile tracking application i.e TrackMeApp but various extended features that the existing system does not have. This system is GPS enabled android mobile phone whose location is tracked. Our application provides the

functionality of defining the geo-fence areas as safe, risky and highly risky [3].

3.4 Android Parental Tracking
Authors: Tejal D. Katore, Gayatri R. Ghogare, Dipeeka R. Shinde, Tejaashri M. Ghule, Prof.Tamhane

The project is designed to be used by parents and aimed to help locating missing or lost children. Also, the children surf over the net, so the browsing history of the children can be seen by the parents. It takes advantage of the fact that many of today's children bring smartphones which is convenient for this kind of situation. In this work, GPS is used along with one of the basic service of a smart phone is SMS. An application at the parent side will allow parents to send a location request to a child side then retrieve the location from the request reply and shows it on a map. On the other hand, the application at the child's side gathers the necessary information of the smart phone that will be used to locate the smart phone [4].

IV. SYSTEM ARCHITECTURE
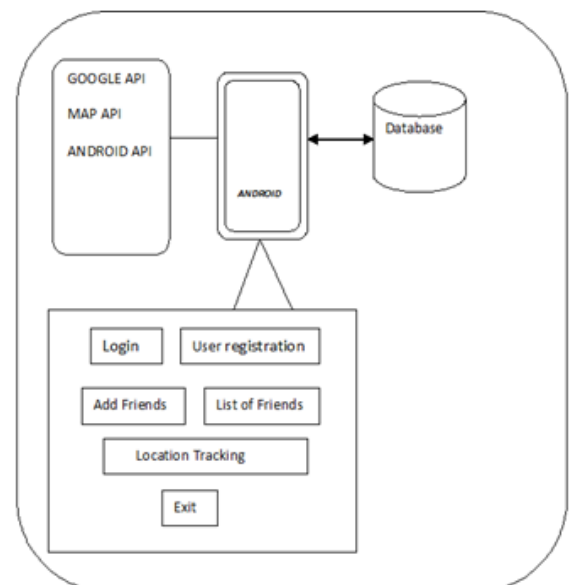
Figure 1. System architecture
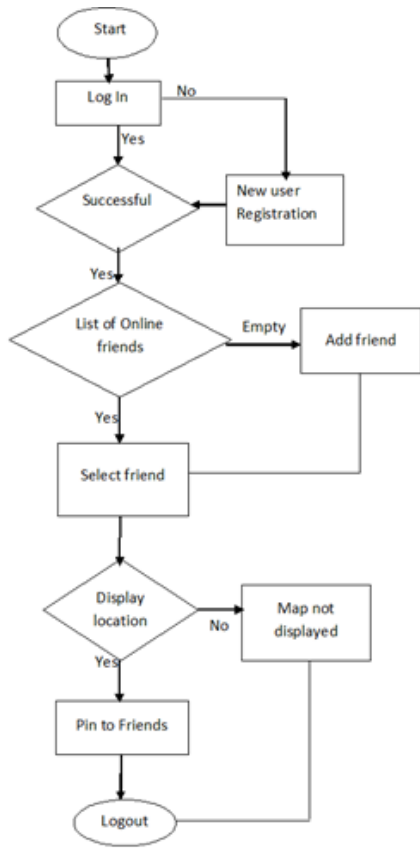
Figure 2. Flowchart

Technologies used

1. **Google Map:** Google map is a web-based service that provides map view and satellite view of many places. User's friend location found by Google map. To display the items by Location Manager tool, one can use the Google Maps external library.

2. **Google API:** Google API is a set of application programming interface developed by Google which allows interaction with google services and third-party applications can also take advantage of this services using Google API for creating Android apps.

3. **Android Location Services:** Location-based information is most important in android mobile application development. Android offers this service, using network location providers, which identify the user's location using GPS. To

get access to this information, an Android developer may use the classes from android.location package, which includes members such as: LocationManager , LocationProvider, LocationListener

Modules

1. Registration and login: Register allows user to create an account in order to use this application. In registration process user have to require add email id, password. After registration user login with their email id and password.

2. User profile

User profile indicates the user details and display the online status of user's friends.

3. Tracking of location

Using Google Maps the current location of user's friends will be identified. It tracks the current location of all members who are online and added in the list.

V. CONCLUSION

Our paper "Implementation of User Tracking Systemin Social Networking using Android" is an application development on android platform. It is classified into one main phase is location tracking. This application uses Google map API and get the user tagged along the map. For this purpose, Android location services like GPS technology are used to find and approximate location of an android mobile phone running this application.

VI. ACKNOWLEDGEMENT

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Iot Based Farm and Monitoring System

Zainab Jouhar*, Ayeman Khan, Piyali Narnaware, Prachi Thombre

Computer science engineering, Anjuman college of engg & technology, RTMNU, Nagpur, Maharashtra, India

ABSTRACT

In India the involvement of technology in agriculture is not been facilitated by the farmers, so to improve this perception towards technology this project has been put forward. The objective is to hike up the use of internet to reduce all the man power required and to inculcate the usage of e- agriculture in farming process.in addition, involvement of different types of sensors make our project more user friendly. IoT is a network device which connects all the electronic devices that are capable of holding and exchanging data. IoT enables remote access to the physical world from computer based world hence leading to reduce manual interface. It also help in increasing efficiency since it can preserve previous data as history. For minimizing physical work and extraneous stress on farmers we are adopting the technology called IoT, which would serve the need of agriculture for farmers. Irrespective of the location, the connected devices can be viewed and operated online. The use of moisture sensor and the temperature sensor are one of the connected devices, that would help user know the condition of the soil and also these conditions would be stored in the database. Involvement of GSM would send an alert message to the user during the scarcity situation.

Keywords: IOT, farm-monitoring, GSM, sensors.

I. INTRODUCTION

As there is a constant enhancement in the technology the incorporation of the same in every field is more promoted. In agricultural domain the involvement to this technology may help in improving the efficiency and the outcomes.

Few system and researches have been put forward for monitoring and managing of the agricultural courses .The intent of our design is to administer both the monitoring as well as the management process of the field. This system comprises of distinct sensors which would calculate the soil status, hence improving the management technique.

The temperature sensor, water level sensors and moisture sensors are the sensors involved which would measure the water content therefore indicating whether the soil is wet or dry.

Along with measuring the temperature of the soil .These measurement can be viewed online by the user and would be store in the directory for easy future access.

In some cases there may be a situation arises where a motor is on irrespective of the water content of the well , if it is below the mark then alert message through GSM can be send to the user .

II. PROPOSED PLAN

- ✓ The process of utilizing technology in farming and cultivation require deep knowledge of agriculture process. In order to design and build a precision agriculture that can be widely used by many users and applied in different context.
- ✓ Designing such a system to improve the state of agriculture that can be used in multiple context is a challenging task and it is too complex of a problem to address in such a broad perspective.
- ✓ this farm monitoring and management system proposed mainly helps in minimising the human involvement in agricultural

Figure 1. A sample line flow diagram showing all the connections.

a. DC water pump -DC water pump is a device that helps in moving fluids and slurries by mechanical action.

b. Temperature sensor - temperature sensor is a device that helps in measuring the temperature through electrical signals.

c. Soil sensor- soil sensor helps in measuring the volumetric content of the soil.

d. GSM- GSM is a mobile communication and it helps in digital cellular.

e. Arduino - Arduino is a open source company that designs and manufactures single board microcontrollers, kits for building digital devices that can sense and control objects from real world.

f. Battery-battery is a device which helps in providing power to the electrical devices.

g. Ethernet-Ethernet is a interface which is used for connecting multiple electronic devices together.

III. WORKING

Figure 2. hardware connections

a. It generate the modern agriculture which is highly knowledge intensive which also requires timely, reliable and accurate information on natural resource endowments.

b. It consists of two detection systems one monitoring and another warning system.

c. Signal send to the controller by sensors, accordingly, the information about the land is updated in the Microcontroller.

d. In case of emergency alert SMS can be passed by GSM and current information are viewed through internet database by using internet.

e. In case of emergency automatic motor has been OFF if the water level is decreased and SMS will send.

IV. RESULTS AND DISCUSSION

By using internet of things majority of farmers were aware about the monitoring and warning detection method in agriculture along with managing the same at the same time. This will facilitate the e-agriculture to accessing the performance of the farmer doing independently. It enables to provide the alert messages and statistical survey report to the farmers by irrespective of location. This study is to provide great potential for improving decision making in agriculture. From this report it extend the agriculture organisation ability to meet the need of its farmers.

V. CONCLUSION

This farm monitoring and management system might prove to reduce the physical work along with a widespread of awareness of the usage of e-agriculture hence improving the performance of the crop yield.

Also, the involvement of gsm in this project enables the farmer to know the crop condition from any location along with an alert message notification during extremes. The use of sensors also enhances this project as they can store the data recorded as the readings in the database which can be accessed as and when required by the user hence making it more user friendly .this prior stored database would help the farmer improve his decision making in agriculture.

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Review on Design and Construction of Electric Drive -A Smart System for Disabled Person with Therapy Facilities

Alfiya Sheikh*[1], Sania Sheikh[1], Abhishek Waghmare[1], Shubham Bhoyar[1], Chetana Dolase[1], Ankit Yadav[1], Prof. Dr. Sayyad Naimuddin[2]

[1]Department of Electrical Engineering, RTMNU, Nagpur, Maharashtra, India
[2]Associate Professor, Department of electrical engineering, RTMNU, Maharashtra, India

ABSTRACT

Physical handicapped people are indivisible part of our society. Many of them are using manual wheelchairs. Now-a-days electric wheelchairs are increasingly demanded because of their advantages and use of simplicity. There are numbers of control systems are implemented in electric wheelchair such as voice operated, gesture controlled, brain controlled etc. The control system is depending upon different parameters such as type of disability, cost, environment in which it is used. Every control system is suitable for different users. The person with severe disabilities required two or more than two control system should be implemented in a wheelchair. This paper focuses on different control system used in electric wheelchair. This paper is mainly literature review of various designs and development of different control systems.

Keywords: Electric Wheelchair, Control Systems, Gesture controlled.

I. INTRODUCTION

In India, according to census-India 2011, the total population of disabled people is 26814994 and there are 5436826 people disabled in movement. This has caused high demand on some form of transport mechanism and thus wheelchairs continue to play a significant role. And facilitate their incorporation into the running world. Wheel chair enables disabled people perform many activities of daily living thus improving their quality of life. Disabled people are increasingly able to lead an independent life and play a more productive role in society. A wheel chair is one of the most important aids for an independent life especially, elderly people in this coming ageing society. Most of the physical handicapped people use manually operated wheel chairs. But these types of wheelchairs are economically not suitable for them. More efforts are required to move forward, reverse, left, right and climb. Electric power wheelchairs have become progressively more essential as assistive technology and therapy devices and the number of users has grown significantly. A wheelchair is a chair with wheels.The device comes in variations allowing either manual propulsion by the seated occupant rotating the rear wheels by hand, or electric propulsion by motors. There are often handles behind the seat to allow it to be pushed by another person. This review paper focuses on the literature review of regarding various methods of controlling the motion direction and other parameter of

wheelchair. There are various methods of controlling such as joystick-operated, voice-operated, tongue-movement operated, Gesture recognition, eye movement, head movement, brain controlled and combination of two or more above mentioned methods etc.A handicapped person with locomotive disabilities needs a wheelchair to perform functions that require him or her to move around. He can do so manually by pushing the wheelchair with his hands. However, many individuals have weak upper limbs or find the manual mode of operating too tiring. Hence, it is desirable to provide them with a motorized smart wheelchair that can be controlled by bio-signal & non bio-signal approach. Since the motorized wheelchair can move at a fair speed with minimum efforts. There are different types of wheelchairs available now days which are discussed below.

A. MANUAL WHEELCHAIRS

These are the type of devices that help a person to move him without any assistance of battery. There are three types of manual wheelchairs namely self-propelled, attendant propelled, and wheelbase. A single-arm drive enables the user to turn either left or right while the two-armed drive enables user to move forward or backward on a straight line. Another type of wheelchair commonly used is a lever-drive wheelchair. This type of chair enables the user to move forward by pumping the lever back and forth [1].

B. ELECTRIC WHEELCHAIRS

A power chair can be used by someone who hasn't got the dexterity or mobility, perhaps, to drive a mobility scooter due to arm, hand, shoulder or more general disabling conditions, and do not have the leg strength to propel a manual chair with their feet. Powered wheelchair can offer various powered functions such as tilt, recline, leg elevation, seat

elevation, and others useful or necessary to health function [1].

C. STANDING WHEELCHAIRS

'Redman power chair', it is the world's highest quality standing wheelchair. People with spinal cord injury can reap the health benefits of standing wheelchair. Physical benefits of standing wheelchairs are

- ✓ Decrease urinary tract infection problem
- ✓ Improver blood circulation around the body
- ✓ Standing exercise greatly improve bowl function
- ✓ Wheelchair helps distribute your weight and improve healing bed sores
- ✓ Decrease the amount of muscle stiffness
- ✓ Increase bone density

D. PEDIATRIC WHEELCHAIR

These types of wheelchair provide a key-enabling technology to young children who would be unable to navigate independently in their environment. Standard powered wheelchairs are still heavily dependent on the cognitive capabilities of users. Unfortunately, this excludes disabled users who lack the required problem-solving and spatial skills, particularly young children. For these children to be denied powered mobility is a crucial set-back; exploration is important for their cognitive, emotional and psychosocial development [3].

E. STAIR CLIMBING WHEEL CHAIR

The stair-climbing wheelchair exists at present can be grouped into 3 categories: - continuous stair climbing wheelchair, intermittent-stair climbing wheelchair and auxiliary stair climbing wheelchair. Continuous stair climbing wheelchair has only one set of supporting device, the wheelchair relies on this supporting device for continuous motions. In

Intermittent stair climbing wheelchair the process of climbing stairs of is similar to the people climbing up and down stairs, it is also called walking stair climbing wheelchair. Intermittent stair climbing wheelchair is one of the supporting devices that elevate the wheelchair and other set of support system. In auxiliary stair climbing wheelchair, the attachments rely on another device installed on the wheelchair and it needs assistance to help realize the function of climbing stairs. Stair lift requires wide stair way which is very expensive [4].

II. LITERATURE SURVEY

Ali A. Abed [1] presented the design of voice controlled smart wheelchair. This paper described the design of smart voice controlled chair in which Arduino microcontroller and speaker dependent voice recognition processor have been used to support the navigation of the wheel chair. The direction and speed of wheelchair controlled by predetermined Arabic voice commands. The speaker dependent, isolated word recognition system (IWRS) for a definite sound of Arabic words to suit the user's necessities has been programmed. There is HM2007 speech processor used for processing the sound i.e. removal of noise and extracting the sound. Microprocessor receives the coded digital signals from the IWRS which being appropriately recognizes voice commands to facilitate control the function of the wheelchair accordingly. The wheelchair does not respond to a false voice commands. The system which is implemented in this wheelchair follows only Arabic language commands. The voice recognition rate varies from 90-100%.

Ms. S. D. Suryawanshi et al. [2] explained that design as well as development of voice operated wheelchair. They used ARM processor. The proposed ARM processor is very convenience to operate wheelchair. They implemented another system includes transmitter and receiver and obstacle detection system. It includes two infrared (IR) sensors, these IR sensors senses the obstacles in the route and gives signal to system which is connected to buzzer and buzzer beeps as obstacle appears. At that time signal also sends to wheelchair control system and wheelchair stops. In this way they proposed a wheelchair which is voice operated and assist safety also for the disabled people.

Rakhi A. Kalantri et al [3] described that automatic wheelchair using gesture recognition. The goal of the paper is to design and develop a system that allows the user to strongly cooperate with the wheelchair at different levels of the control and sensing. The movement of wheelchair forward, backward, left and right is depend upon head movement of the user. They use acceleration sensor for sensing head movement, it works on acceleration principle. If user tilts his head in any direction above 20degree angle chair will move in that direction. The working principle of their wheelchair is the principle of acceleration, one acceleration sensor, provides two axes, acceleration sensors whose output is analogs, varies according to acceleration applied to it, by using simple formula amount of tilt can be calculated and output of tilt will decide to move in which direction. They installed AT89C51 microcontroller and L293D driver IC. The software requirement was Kiel uv3 for implanted C programming. They also installed four IR sensors for detecting the obstacles. Mohammed Asgar et al. [4] proposed an automated innovative wheelchair controlled by neck position of person. They used LEDs, photo sensor, motor and microcontroller to control the movement of wheelchair. The proposed wheelchair is particularly designed for the intention of eliminating high price

and also for those who are amputees. Automated innovative wheelchair is a wireless system designed for the physically handicapped people specially. This is a type of wheelchair which even can be easily driven by those who do not have arms or legs or both. Neck-movement of the user will control the motion of the wheelchair. It incorporates LEDs and photo-sensors to achieve this task. LEDs and Phototransistors give very good response in all atmospheric conditions. The components used in this wheelchair do not get affected by the small change in atmosphere. The wheelchair is provided three points at which LED's and photodiodes/transistors can support to generate one of the control signals which were predefined. The user can give two commands to this wheelchair i.e. right and left. To control the straight direction there is no additional sensor. To move the wheelchair in the forward direction it is needed to align any of the LED and photodiode/phototransistor and look straight. And to stop it just bows the head for two seconds. After stopping the wheelchair user is free to move his neck but have to take care that light should not fall on any of the photo sensors else the wheelchair will turn on. In short there is constraint on neck movement. But for user ease they have taken care that will allow the user to move the neck around 60-70 degree in either direction. To avoid any accident numbers of provision are taken in wheelchair. Pothole detector and Obstacle detector are installed in this wheelchair for safety purpose.

Monika Jain et al. [5] explained the design of tongue operated wheelchair. The "Tongue Dive System" is a tongue operated Assistive Technology (AT) developed for people with severe disability. Tongue Drive consists of an arrangement of Hall Effect magnetic sensors mounted on a mouthpiece to quantify the magnetic field generated by a small permanent magnet mounted on the tongue. This technology works by following the travels of a permanent magnet, mounted on the tongue, using an arrangement of linear Hall-effect sensors. This allows a small arrangement of sensors to sense a large number of tongue movements. These sensors send a signal to control panel and then to wheelchair drive system and respective action will be taken. The sensor outputs are a function of position-dependent magnetic field generated by the permanent magnet. Therefore, provides faster, smoother, and more suitable relative control over the wheelchair drive system.

Nikhil R. Folane et al. [6] presented Electroencephalogram (EEG) based brain controlled wheelchair for physically disabled people. If user has serious disability and no control on muscles cannot use the other control system like joystick etc. Therefore Brain Computer Interface (BCI) system has been developed for controlling the movement of wheelchair. In proposed system brain send command directly to physical devices. Mostly there are two types of Brain Computer Interface techniques, invasive and noninvasive technique. In invasive technique the brain signals are recorded by an implanting electrode directly into cortex of brain. In noninvasive technique electrode is located on scalp of brain. Electroencephalography (EEG) is an example of noninvasive technique of detecting brain activity. Their system is primarily depends upon EEG waveforms. Brainwave sensor, MATLAB and ARM Controller are the significant factors of system. Brainwave Sensor senses the brain activity and generates the signal which sends to computer system. In computer system MATLAB receives the signal and analyses it and Artificial Neural Network (ANN) based algorithm is use for decision making. This algorithm receives values from sensor and analyzed it and produces relevant command. To use this type of system user have to take training for better stability.

Srishti et al. [7] proposed design and development of smart wheelchair using voice recognition and head gesture control system. This system is combination of voice control and head gesture control system. This wheelchair is built-in with acceleration sensors, ultrasonic sensor and voice recognition module. By tilting the acceleration sensor, wheelchair can be moved in the four directions. Using the voice recognition module, the occupant can manage the movement of chair by giving the voice instructions such as Forward, Backward, and Left & Right. And also ultrasonic sensor is used in this wheelchair to sense the obstacle in the path. Voice Recognition Module V2 is build in this system to recognize the voice

and it supports 80 commands and 7 commands can work at a time. The accelerometer ADXL 335 is an electromechanical sensor is used for recognizing gesture. This 3 axes accelerometer sensor produces voltage in 3 direction based on gestures. The microcontroller ATMEGA2560 is programmed using C language for the controlling of wheelchair using gesture control. If person is unable to move head then he or she can control the movements by giving command by voice. This system is more user-friendly.

III. DRAWBACKS OF PRESENTLY AVAILABLE WHEELCHAIRS

Most significant technical issue in the currently available wheelchairs is cost versus accuracy. Unavailability of wheelchairs for particular disabilitiy is also a considerable issue. Also, the present systems are unable to monitor the surrounding conditions and the health condition of the patient. There is also no wheelchair available till date for the bed lying patient. No wheelchair available for mentally challenged people also. Above all the other important aspect to consider is the physical barrier that place additional requirement on strength and durability of wheelchairs.

IV. DISADVANTAGES OF ELECTRIC WHEELCHAIR

As wonderful as a new electric wheelchair may be to help user recover some mobility, they aren't for everyone. They do have limitations, which need to be taken into consideration.

1. **Maintenance & repair:** The cost of maintaining and repairing an electric wheelchair can be significantly higher than a manual wheelchair.
2. **Initial expense:** Electric wheelchairs are typically more expensive than manual wheelchairs.
3. **Size:** Electric wheelchairs are larger than manuals and may not be suitable in every home.
4. **Weight:** Electric wheelchairs are much heavier than manual chairs. The size and weight makes them less portable than manual chairs and perhaps be too heavy for some lifts.
5. **Limited power:** If the battery packs are not recharged properly, user may end up with a dead battery before user return home.
6. **Difficult for others to movement:** If user become unable to move user's electric wheelchair on user's own, pushing it is very difficult because of its weight and its build.
7. **Shouldn't be only chair:** If user has an electric wheelchair, he or she still needs to have a manual chair on standby

V. CONCLUSION

In this study we have concluded that there are number of ways of control system used to control the movements of wheelchair. No any one method is suitable for all type of physical disability. The controls are dependent on environment also, voice

operated control system cannot used in noisy environment. Multiple control system implemented in a wheelchair is quite suitable to overcome this disadvantage. But as control system increases the cost also increases a lot so there is also limitation on implementation number of control system. There is no any system which makes physical disabled people fully independent. Different control system should be used for different type of physical disability. This paper presents a summary of current state-of-the-art smart wheelchairs. Various techniques are available to operate and control the wheel mechanism of wheelchair. Some of operating techniques of wheelchairs have been explained here. This information is gathered to promote awareness of status of existing types of smart powered wheelchair so that the improvement can be incorporated into it.

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Pricing of Transmission Network Usage using MATPOWER

Mrs. Archana Shirbhate*, Mr. V. K. Chandrakar, Mr. R. M. Mohril

Department of Electrical Engineering, RTM Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

The liberalization of electricity market has led to a higher demand for transparency in congestion management. This paper studies the suppliers' participation in the nodal price congestion component. In the present work, the nodal prices have been divided into a component for the generation and the losses and a system congestions' component. The nodal prices have been computed and analysed using a modified version of MATPOWER. In addition this paper investigates the consequences of system participants bids behaviour and its influence on the power system situation. Results from a 9-nodes test system as well as from a realistic high voltage network are also presented.

Keywords: OPF, Power Market, Transmission Pricing, IEEE bus, Pool Market, bid

I. INTRODUCTION

Almost all existing and proposed transmission pricing models are cost based. That means, they allocate all or part of the existing and new transmission systems to wheeling customers. Based on this, transmission pricing paradigms can be defined which convert the transmission costs into transmission charges . Three basic paradigms are:
- ✓ Rolled-in (embedded) transmission pricing
- ✓ Marginal transmission Pricing
- ✓ Composite transmission pricing

The power markets throughout the world are classified based on two dispatch philosophies: centralized dispatch and decentralized dispatch . The decentralized dispatch markets are the ones in which rolled-in paradigm of transmission pricing is commonly employed. On the other hand, the

centralized dispatch markets employ the marginal or the composite pricing paradigm.

An alternative way of classifying transmission pricing schemes is based on when they are calculated, i.e., ex-ante or ex-post . In the ex-ante schemes, the entities taking part into the power market activities know the transmission prices a priori. While, in ex-post schemes, the transmission charges are calculated only after the real time has elapsed and power flow snap-shot is available. These schemes can further be categorized into transaction based and non-transaction based. The transaction based schemes essentially should have a defined source point and a sink point (bilateral transaction). On the other hand, non-transaction based schemes refer to the power exchange (PX) trades, where it is not possible to identify source-sink pair. Figure 7.1 shows the broad categorization of various transmission pricing schemes.
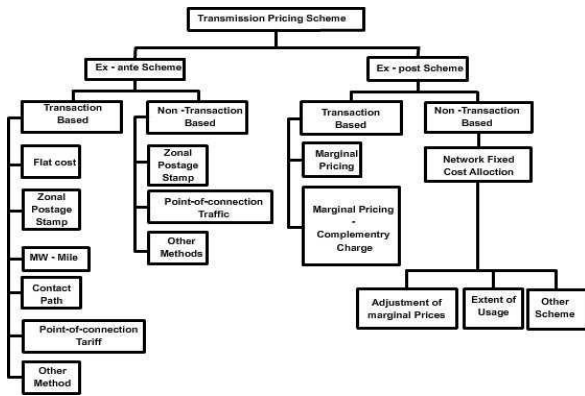
Figure 1. Classification of transmission pricing schemes

In the above figure, the transmission pricing schemes are classified on the basis of whether they are calculated ex-ante or ex-post. Generally, the ex-ante schemes are made up of pricing methods under rolled-in paradigm. As mentioned earlier, the total costs to be recovered are known a-priori and then they are transformed into transmission prices. The ex-post schemes, on the other hand, rely upon the incremental or marginal pricing mechanism. Moreover, the incremental schemes lack the property of recovering transmission sunk costs and hence rely upon schemes under the domain of rolled-in paradigm to overcome this lacuna. This gives rise to the composite paradigm.

II. PRINCIPLES OF TRANSMISSION PRICING

To operate the power system under the regime of transmission open access, a trade-off has to be solved: Economic marketing of energy has to be given importance while at the same time; it should be ensured that the whole system operates in a reliable and secure manner. The main purpose of any transmission pricing scheme is not limited to recovery of the sunk costs involved in bringing up the transmission infrastructure. The transmission pricing scheme should do much more than that. In line with the above, following principles should be followed while designing the transmission pricing schemes.

- ✓ The transmission prices should be devised so as to promote the efficiency of day-to-day operation of bulk power market.
- ✓ The transmission prices should signal locational advantages for investment in generation and demand.
- ✓ They should signal the need for investment in the transmission system.
- ✓ The transmission prices should recover the costs of existing transmission assets.
- ✓ Transmission pricing mechanism should be simple and transparent.
- ✓ The mechanism should be politically implementable.

Out of these, the first three objectives are concerned with derivation of appropriate economic signals to either utility or the consumer. However, the fifth objective states that the signals should not be so complicated that one can not decipher the same and react to it. Fourth and sixth objectives are associated with the allocation strategy of the pricing mechanism. Briefly speaking, the first objective speaks about the short term efficiency, numbers 2-4 with long term efficiency and 5, 6 with implementation.

There are different transmission pricing mechanisms prevailing in different parts of the world. They differ on a lot of parameters like: whether they use incremental methods to price the transactions or they go for rolled-in cost methods; whether generator pays the wheeling charge or the consumer pays for it, or both pay a part of it in some proportion, etc. It is expected that while designing a transmission pricing mechanism,

following cost components for providing transmission service should be taken into account :;

- ➤ Operating Cost: This includes the cost mainly due to generator rescheduling, maintaining system voltage, reactive power support and line flow limits.
- ➤ Opportunity Cost: It is the cost which a transmission company (Transco) has to forgo due to operating constraints that are caused by the transmission transaction.
- ➤ Reinforcement Cost: This cost is charged to only firm transactions and includes capital cost of new facilities required to meet the transaction.
- ➤ Existing System Cost: The investment cost of existing transmission facilities used by the transmission transaction.

III. METHODS OF TRANSMISSION PRICING

This section provides principles for transmission pricing. Although transmission costs represent only about 2 percent of investor-owned utilities operating expenses, they are nonetheless important. Workable competitive power markets require ready access to a network of transmission and distribution lines that connect regionally dispersed end-users with generators. Because power flows at one location impact electric transmission costs across the network, transmission pricing may not only determine who gets access and at what price but also encourage efficiencies in the power generation market [8].

Transmission constraints can prevent the most efficient plants from operating. These constraints also can determine the location of generation that affect the amount of power losses for transmission. Transmission prices that ignore these concepts will produce an inefficient system. Transmission pricing

that considers transmission constraints (congestion pricing) should encourage the building of new transmission and/or generating capacity that will improve system efficiency.

2.1 Pricing Options

Costs categorized as Congestion Cost and Transmission Line Pricing can either be assigned directly to users causing the congestion or shared among all users. If the transmission system becomes congested so that no more power can be transferred from a point of delivery to a point of receipt of power, thus more expensive generation may have to operate on one side of the transmission than the other. For a competitive market, regardless of the form of transmission pricing utilized, this would result in a difference in generation prices between the two locations. (If any low cost power generated on one side of a constraint could be sold at the higher price on the other side of the constraint, assuming the difference is more than the transmission cost, in the absence of the congestion.) The differences in electricity prices is the "economic price of transmission", which is related to the congestion cost and cost of losses. For such absence of congestion pricing for transmission service, the "economic rents" would represent a windfall to the generation suppliers that are able to sell through the congested interconnection. Hence, transmission prices will recover congestion rents from suppliers who are able to complete transactions through the constrained interface .

There are various ways to allocate revenues from congestion pricing. For example in California, such types of revenues are used to reduce the access fees that all transmission customers pay. Another proposal thought is to create a system of transmission congestion contracts. These would establish set of rights to either make power transfers or receive compensation for the inability

to do so through redistribution of congestion rentals to the holders of transmission congestion contracts.

This paper evaluates the following eight transmission pricing algorithms:

a) Postage Stamp;

b) MW-Mile (original);

c) Unused absolute MW-Mile;

d) Unused reverse MW-Mile;

e) Unused zero counter-flow MW-Mile;

f) Used absolute MW-Mile;

g) Used reverse MW-Mile and

h) Used zero counter-flow MW-Mile.

a. THE POSTAGE STAMP METHOD

One of the traditional methods is the postage stamp method (PS), also known as the rolled-in method [12]. According to this method, the network usage from the side of a transaction is measured by the magnitude of the transaction Pi, without taking into account how the transaction affects the power flows over the various lines in the network[7]. The amount to be paid by transaction is:

$$PS_i = K \frac{P_i}{\sum_{j=1}^{n} P_j} \dots \dots \dots \dots \dots \dots \dots \dots [1]$$

Where

K : the total cost to be covered by the market participants

PSi : the amount charged to participant according to the postage stamp method

Obviously, since the postage stamp method does not take distances into account, it leads to cross-subsidization of long-distance transactions by short-distance transactions. Despite this fact, this method is widely implemented because of its simplicity.

b. FEATURES OF SIMULATOR BASED ON CONGESTION MANAGEMENT

The congestion management system was formulated according to a flowchart as shown. Readily available information on the current state of affairs can be found on the FRONT PANEL of associated online website. Here one can find a detailed time related information, an overview of key decisions, introduction of new working methods and modifications related to the dispatch, rates, competitive bidders, technical know-how, transaction details, history etc.
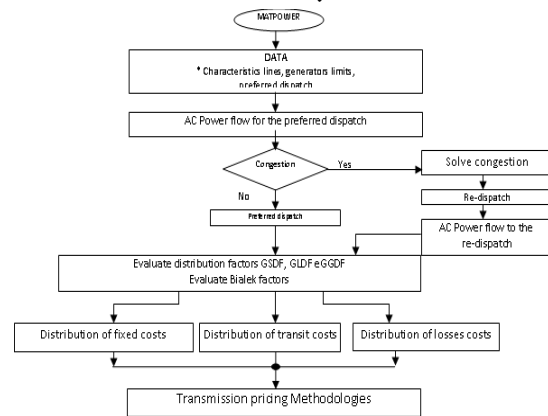
Figure 2. Flowchart for re-dispatch based congestion management.

This flowchart clearly states optimal power flow with and without congestion and calculation of performance and cost parameters thereafter.

IV. OF TRANSMISSION PRICING PARAMETERS FOR IEEE 9 BUS CASE STUDY

The single line diagram of IEEE-9 bus test system is shown in Fig. 2 The data is given in Annexure-A. It illustrate the different results and characteristics between the pricing schemes for each pricing method. The obtained results are shown in Fig 3. This Fig. gives the solution when the system condition before changing. Fig. 4 and Fig5 gives idea when load changes by 5 percent, 10 percent

and the . Tabular representation is given in table 8.2 and 8.3. Numerical examples are provided to compare the results using different pricing methodology. At the end of the thesis, a case study is carried out to access the effectiveness of the methodology developed.
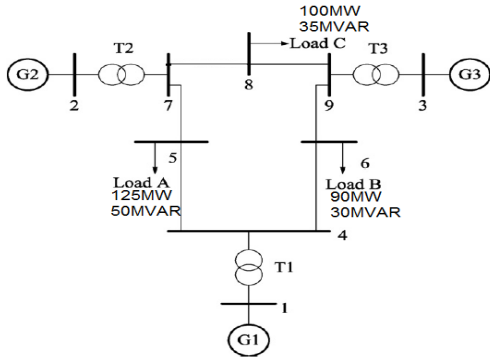
Figure 2. Single Line Diagram of IEEE 9 bus test system

Table 1. Tabulated Transmission Pricing based on different methods when load demand is actual

	G1(Pricing) in $	G2(Pricing) in $	G3(Pricing) in $
Postage Stamp	24711	29923	21676
MW-Mile (original)	57562	40759	40000
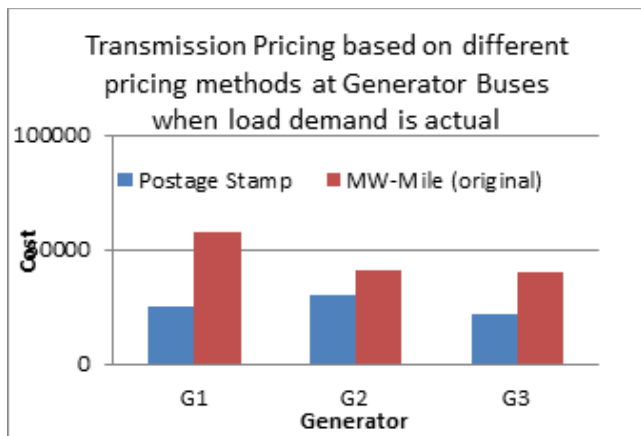
Figure 3. Transmission Pricing based on different pricing methods at Generator Buses when load demand is actual

V. CONCLUSION

In this paper, a power system simulation package referred to as MATPOWER is used extensively to study the Optimal Power Flow (OPF) of the system. In this paper, as a first remedy is shown to be an efficient in managing congestion in the competitive market. The use of in aiding congestion management is shown to provide additional benefit to the system, in terms of both clearing the congestion. With , the contracts after market Re-dispatch are more or less the same as the originally scheduled, which is highly appreciated by both suppliers and customers. The results were tasted IEEE 30 bus system. Simulation were carried out in MATLAB. Here we find the TLR sensitivity and decide where we have to apply for solving congestion and then we verify the simulation results. It has been observed that from simulation results on various systems, clear possibility of optimized location of and relaxation of congestion. Perfect location of ease out congestion proves to be of technical as well as economical benefits.. For location leads to better results. The results are verified by MATPOWER.

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Ask Me Forum-Crowdsourcing

Prof. M. S. Khatib, Prof. NaishaTaban, Prof. Farheena Sheikh, IffatSaleha, Sana Khan
Computer Science And Engineering Department, ACET Sadar , Nagpur, Maharashtra, India

ABSTRACT

Today people use the Internet to find the answer totheir questions. They mostly rather ask other users onCommunity Question Answering (CQA) sites for an answer thanjust searching theweb. However, as Social Media becomes morepopular, users tend to ask their questions on these networks, andignore the benefits CQA sites offer. On the other hand, automaticQuestion Answering (QA) systems are unable to comprehendquestions including images and implementing necessaryalgorithms for such systems is expensive. In this paper, wepropose QA process based on Crowdsourcing, which runs on aQA open system. The system benefits from Crowdsourcingadvantages, besides automation techniques. The model isoperational and we have demonstrated that questions could bereceived from different heterogeneous sources, if the suitableprocedures are used, and that the answer is obtained from thecrowd in the proposed process based on Crowdsourcing.Moreover, the first Iranian crowdsourcing platform forcomplicated tasks is implemented, which could be used as a basisfor future research.

Keywords: Crowdsourcing; Web; Question Answering

I. INTRODUCTION

Internet users usually use search engines to find the answerto their questions. However, when they fail to transform theirneeds such as a short query, theyassume that they will not find the answer to their open questions, personal questions and the onesassociated with specific conditions into complicatedquestions by searching the webpages directly, and that a realhuman being would understand their problem much better thana machine. In these cases, users usually would prefer to asktheir questions on Community Question Answering (CQA)sites such as Yahoo! Answers, Quora and StackOverflow,rather than issuing a query to a Web search engine, this wayother users

could provide the answer. Moreover, in order tofind the answer to a question in webpages using searchengines, the user must choose suitable keywords which notevery user is capable of.Increasing number of questioners in CQA and the fewaccounts providing answers, has led to an increase inunanswered questions. The results of a research done onYahoo! Answers show that 15 percent of all English questions,have remained unanswered and that 25 percent of the questionsin each category are repetitious[1]. Further, the percentage ofunanswered questions in Persian is higher, due to the shortageof Persian content on the internet. As Social Media becomesmore popular, people prefer asking their questions on thesenetworks instead of CQAs, because of the

benefits thesenetworks provide[2]. Therefore, they are unable to benefit fromthe advantages CQAs offer. Automatic QA systems aredeveloped to overcome the unanswered questions issue. Anautomatic QA system is a system which produces a suitableanswer for the received question and present it to thequestioner. Building such systems requires using complicated.

II. SYSTEM ARCHITECTURE
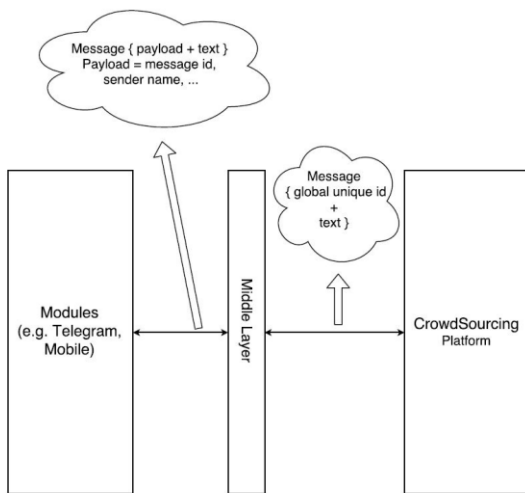
Figure 1. Architecture of the proposed system

cidentified as aquestion, simply because it contains a questionmark. After exploring questions asked inTelegram groups, we presumed that messages containing "explain" or "introduce" keywords and a question mark.

2) Registering In The Middle Layer

The role of middle layer is to eliminate the existingdependencybetween rowdsourcing and the sources providingquestions. To add a new source in order to collect questions ortesting new algorithms in identifying uestions, you are justrequired to develop a new independent module (using anyprogramming language and over any platform). All modulesmust be registered in middle layer and receive a uniqueidentifier.

Any module could send questions to the middle layerURL, using its unique identifier. Modules send question andadditional information (information needed for the module,e.g. requester's ID in Telegram) to the middle layer URLusing Json format, to be stored in the middle layer database.

3) Question Tagging By Workers

Since in this QA system, the priority of scalability is high,no restriction is considered for posting questions. For instance,if a requester had to declare the subject of question atsubmission time, then it was no longer possible to receivequestions from some social media networks such as Twitter,

which have a character limit.Yet, more information is required in order to organize

questions. With addition of tagging task to QA process,workers append metadata to the question. In this system,question's metadata include question difficulty, question tags.

III. METHOD

Here QA process is a set of operations and steps a questionhas to take through the proposed system, so that a final result is

produced and sent to the requester.
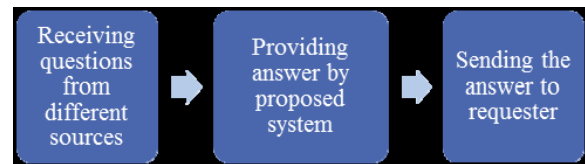
Figure 2. QA process in the proposed system

Figure 3. General QA process
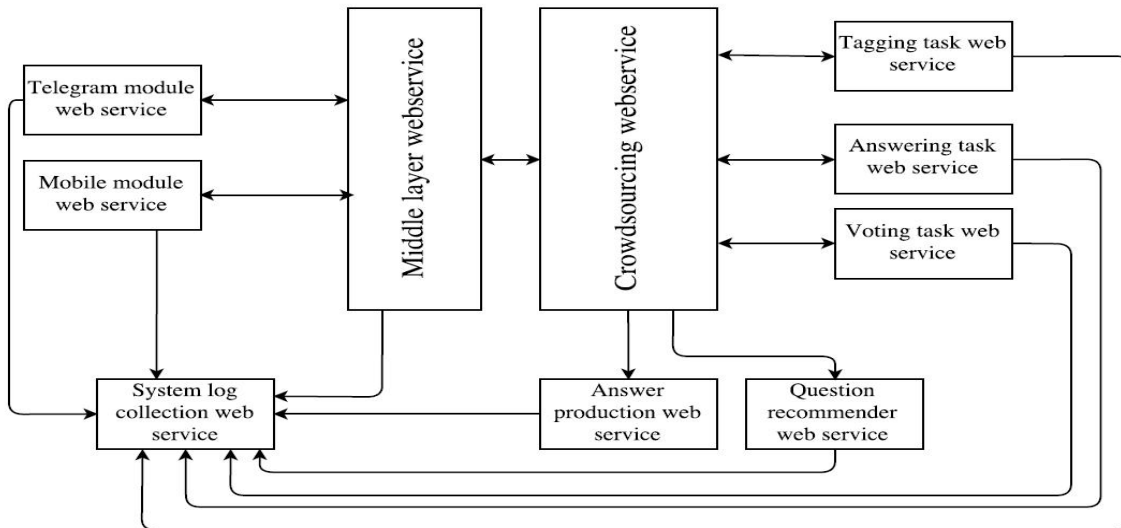
Figure 4. Web services of the proposed system

IV. CONCLUSION

This paper attempts to overcome the existing challenges incurrent QA systems, by exploiting crowdsourcing advantagesand automatic techniques. Here, we propose a QA systembased on crowdsourcing. The main purpose of this researchwas proposing a QA system, however it required acrowdsourcing platform. Since these platforms are onlydeveloped in other countries and they are not available forIranian researchers, we were compelled to develop a nativecrowdsourcing platform as a secondary purpose. Openness isthe most important characteristic of the proposed system. Thischaracteristic allows other researchers to investigate relatedsubjects in the future, without the need to implement a newQA system. They could also use the proposed system forevaluation purposes.

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Transmission Pricing in Deregulated Power System for IEEE 30 bus

Mrs. Archana Shirbhate*, Mr. V. K. Chandrakar, Mr. R. M. Mohril
Department of Electrical Engineering, RTM Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

Transmission pricing has become a major issue in the discussions about the deregulated electricity markets. Consequently, open access to the transmission system is one of the basic topics to allow competition among participants in the energy market. Transmission costs have an important impact on relative competition among participants in the energy market as well as on short- and long-term economic efficiencies of the whole electricity industry, although they represent only close to 10% of the energy market price. This paper deals with the design and tests of a transmission pricing method based on the optimal circuit prices derived from the economically adapted network (EAN). The computation and the analysis of the nodal prices have been realized with a modified version of MATPOWER. In addition this paper analyses the consequences of system participants' bid behaviour and its effect on the systems congestion. Prices derived from the EAN have the advantage of being in tune with the maximum revenue allowed to the owner of transmission assets and simplifying the optimal allocation of transmission costs among participants. Beginning from the conceptual design, the proposed method is tested on a three-bus network and on the IEEE 30-bus reliability test system.
Keywords: OPF, Power Market, Transmission Pricing, IEEE bus

I. INTRODUCTION

The move of the electric power industry in the last years from a monopolistic to a deregulated form has resulted in various changes in the operation of the electrical networks. Among them the congestion management has been a very important concern for an ISO. The management of such situations consists of two basic elements, which are interdependent. The first concerns the redispatching of generation or even more partial curtailment of loads, which may be necessary. The second is the pricing of the congestion and the proper cost allocation among the market participants. In order to deal with this

task the ISO needs a clear and precise view of the power system situation regarding the technical as well as the economical side. One of the competitive electricity market types is the Pool Market model. The main characteristics of this model are the pricing for electricity using the results of an optimal power flow (OPF) program and an associated bid-based dispatch in order to fit producer supply and consumer demand. The power nodal prices vary by location to reflect, among other things, the losses generated in supplying power to a bus and the system congestions when they exist. The congestion management is based on the congestion component of nodal prices. Particularly, the computation and

the analysis of the nodal prices have been realized with a modified version of MATPOWER program Moreover, the consumers' elasticity has been also taken into consideration in this version. This paper explores the share of market participants in the nodal congestion component. In particular, producers' impact is focused on. In addition the paper deals with the gaming of the producers. The consequences of their bid behaviour and its effect on the system congestions are discussed. Results from simulated experiments are presented on a 30-bus test system as well as on a realistic high voltage network In the restructured electricity market, Transmission Company plays a vital role due to its involvement in the determination of charges for transmission pricing. In the traditional regulated power market, pricing have accounted for a small portion of the overall transmission network capacity usage. However, recent trends are stimulated renewed interest in pricing of transmission or distribution facilities of a system to transmit power of and for another entity. It is also states that, pricing is the use of some seller to buyer involving transmission network of a third party. Transmission cost is due to re-dispatching of generators and transmission losses [7] [8].

Transmission pricing is carried out:

1. To recover the capital and operating costs
2. To encourage efficient use and investments.
3. To provide equal opportunity to all users.
4. To offer a simple and understandable price structure.
5. To easy implementation.

This paper analyses all eight pricing methodologies. Previously all these methods have been evaluated [7] but best method for pricing is not identified. Particularly, in this paper, we have tested pricing methodologies under various load conditions and Moreover, it is clear that Unused reverse MW-Mile method gives minimum pricing method even when the load changes. The proposed has been tasted on IEEE 14 bus and IEEE 30 bus system using MATPOWER simulation programs. The working flow charts of eight pricing method has been presented in this paper. We have done the calculation in an optimal Power Flow solution. A Graphical representation of the allocation obtained by this method which is given in figures.

II. METHODS OF TRANSMISSION PRICING

This section provides principles for transmission pricing. Although transmission costs represent only about 2 percent of investor-owned utilities operating expenses, they are nonetheless important. Workable competitive power markets require ready access to a network of transmission and distribution lines that connect regionally dispersed end-users with generators. Because power flows at one location impact electric transmission costs across the network, transmission pricing may not only determine who gets access and at what price but also encourage efficiencies in the power generation market [8].

Transmission constraints can prevent the most efficient plants from operating. These constraints also can determine the location of generation that affect the amount of power losses for transmission. Transmission prices that ignore these concepts will produce an inefficient system. Transmission pricing that considers transmission constraints (congestion pricing) should encourage the building of new transmission and/or generating capacity that will improve system efficiency.

2.1 Pricing Options

Costs categorized as Congestion Cost and Transmission Line Pricing can either be assigned directly to users causing the congestion or shared among all users. If the transmission system becomes

congested so that no more power can be transferred from a point of delivery to a point of receipt of power, thus more expensive generation may have to operate on one side of the transmission than the other. For a competitive market, regardless of the form of transmission pricing utilized, this would result in a difference in generation prices between the two locations. (If any low cost power generated on one side of a constraint could be sold at the higher price on the other side of the constraint, assuming the difference is more than the transmission cost, in the absence of the congestion.) The differences in electricity prices is the "economic price of transmission", which is related to the congestion cost and cost of losses. For such absence of congestion pricing for transmission service, the "economic rents" would represent a windfall to the generation suppliers that are able to sell through the congested interconnection. Hence, transmission prices will recover congestion rents from suppliers who are able to complete transactions through the constrained interface .

There are various ways to allocate revenues from congestion pricing. For example in California, such types of revenues are used to reduce the access fees that all transmission customers pay. Another proposal thought is to create a system of transmission congestion contracts. These would establish set of rights to either make power transfers or receive compensation for the inability to do so through redistribution of congestion rentals to the holders of transmission congestion contracts.

This paper evaluates the following eight transmission pricing algorithms:
a) Postage Stamp;
b) MW-Mile (original);
c) Unused absolute MW-Mile;
d) Unused reverse MW-Mile;

e) Unused zero counter-flow MW-Mile;
f) Used absolute MW-Mile;
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a. The Postage Stamp Method

One of the traditional methods is the postage stamp method (PS), also known as the rolled-in method [12]. According to this method, the network usage from the side of a transaction is measured by the magnitude of the transaction Pi, without taking into account how the transaction affects the power flows over the various lines in the network[7]. The amount to be paid by transaction is:

$$PS_i = K \frac{P_i}{\sum_{j=1}^{n} P_j} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots [1]$$

Where

K : the total cost to be covered by the market participants

PSi : the amount charged to participant according to the postage stamp method

Obviously, since the postage stamp method does not take distances into account, it leads to cross-subsidization of long-distance transactions by short-distance transactions. Despite this fact, this method is widely implemented because of its simplicity.

Figure 1. Flowchart for Postage Stamp Method

III. RESULTS OF TRANSMISSION PRICING PARAMETERS FOR IEEE 30 BUS CASE STUDY

The single line diagram of IEEE-30 bus test system is shown in Figure 2. The system consists of 8 synchronous generators and the system has 21 load points. Associated flow results along with Transmission Pricing are given in Figures and Table as shown below. Table 1 and 2gives the idea about initial dispatch and re-dispatch value which is given in Fig.3 it also gives their differences. Table 8 provide the contribution of each generator and each load to the line flows under all methods. It illustrate the different results and characteristics between the pricing schemes for each pricing method. The obtained results are shown in Fig 4 This figure gives the solution for the minimum power transaction problems. Unused reverse Mw-mile method gives the minimum price. Fig4gives Transmission Pricing based on different pricing methods at Generator Buses tested under three conditions like on actual load, 5% increase in load and 10 % increase in load.. Tabular representation is given in table 8,table9 and table10. Analysis is that Unused reverse Mw-mile method gives the minimum price even if the load changes. Numerical examples are provided to compare the results using different pricing methodology. The both the case study, result indicates that unused reversed MW-mile method for transmission pricing is most suitable method.
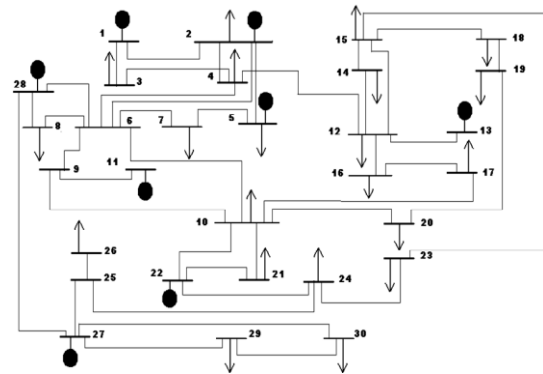
Figure 2. Single Line Diagram of IEEE 30 bus test system

Table 1. Congested lines for Initial Dispatch

Line	Maximum Capacity	Expected line flow capacity	Actual Line flow
1	50	45	46..5290
2	20	18	19.9822
5	30	27	29.9942
9	30	27	29.9986
13	30	27	29.9867
16	30	27	29.9937

Table 2. Re-Dispatch (MW)

Line	1	2	5	9	13	16
OPF	62.5	25	37.5	37.5	37.5	37.5

Figure 3. Difference in Initial power flow and Re-Dispatched Power at All Buses in Power System.

Table 3. Tabulated Transmission Pricing based on different methods when load demand is actual

	G1	G2	G3	G4	G5	G6	G7	G8
Postage Stamp	20997	5604	10734	8994	8950.3	7523.3	3075.7	3099.8
MW-Mile (original)	21331	15188	16821	16530	13748	15726	15281	15000
Unused absolute MW-Mile	589.58	412.31	620.26	648.53	505.08	497.07	583.42	617.16
Unused reverse MW-Mile	383.81	232.94	462.09	437.23	207.25	405.24	372.46	431.55
Unused ZCF MW-Mile	509.69	346.81	558.71	571.69	391.30	464.19	500.25	544.28
Used absolute MW-Mile	7390.8	4227.4	8604.3	8376.5	5988.5	5880.5	7871.4	7995.3
Used reverse MW-Mile	5761.1	2859.9	7357.9	6865.3	3921.3	5066.8	6296.8	6541
Used ZCF MW-Mile.MW	6775.9	3543.6	7981.1	7620.9	4954.9	5473.7	7084.1	7268.1
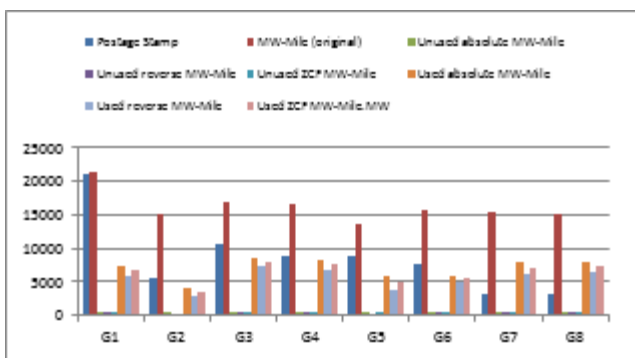
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"Endorsement with Virtual Reality"

Saleheen Anwar¹, Nidhika Pardhi¹, Sadaf Qureshi¹, Ilma Naaz¹, Afreen Khan¹, Alfiya sheikh¹,
Prof.M.S.Khatib², Prof.Syeda Kaneez Khatoon³
¹Computer science , rtmnu, srmcew, Nagpur, Maharashtra, India
²Head of computer scienece, Nagpur, Maharashtra, India
³professor of computer scienece, Nagpur, Maharashtra, India

ABSTRACT

Virtual reality is an automation which is often regarded as a natural extension to 3D computer graphics with advanced input and output devices. The integration of this new technology with software systems for engineering, design, and manufacturing will provide a new boost to the field of computer-aided engineering. One aspect of design and manufacturing which may be significantly affected by virtual reality is design for Endorsement. This paper presents a research effort aimed at creating a virtual reality design environment website. Today, marketers benefit greatly from using virtual reality in advertising. The first and the most important advantage of VR ads is that they help to create a certain emotional connection with customers. Virtual reality ads are so interactive and realistic that consumers feel like they're playing an engaging video game. This builds an emotional connection, increasing brand awareness and encouraging users to enjoy this hi tech.

Keywords: Virtual Reality, Augmented reality, VR photography, 360 Video.

I. INTRODUCTION

This special issue is dedicated to highlighting recent advances in VR software and technology for Endorsement or Advertisement purpose.

The article "Endorsement with Virtual Reality" presents a novel method that focuses on Virtual Reality techniques that are becoming more widespread and Endorsement is one of the fields which can benefit from their use. Virtual Reality (VR) is on the verge of becoming commodity hardware available to the average user and feasible to use as a tool for 3D work. Some VR include front-facing cameras, enabling Augmented Reality (AR) functionality. Apart from avoiding collisions with the environment, interaction with virtual objects may also be affected by seeing the real environment. However, whether these effects are positive or negative has not yet been studied extensively. Although virtual reality (VR) has a huge success in increasing the quality of scientific visualization applications, there is a considerable lag in the development of VR applications in the case of information visualization. Some researchers claim that 2D representation are enough for data analysis; however, in the case of multi-dimensional datasets, other researchers indicate that studying

multiple dimensions simultaneously is advantageous [1], [2], [3].Virtual reality interfaces have been used successfully for many years in the field of scientific visualization, with hundreds of both commercial and academic software systems created in the field of astronomy, physics, chemistry, biology, medicine, and engineering. Virtual and augmented reality could change the world. Through full immersion, users can live out stories they've only ever dreamed of, be transported to an exotic place without leaving their house and interact with products as if they were viewing them in actual reality. The technology seems like the next step in media progression – it started with print then moved from photo to video, and full immersion would complete the circle of escapism and experience that media companies have strived to create for decades.

II. HISTORY OF VR

Virtual reality has beginnings that preceded the time that the concept was coined and formalised. In this detailed history of virtual reality we look at how technology has evolved and how key pioneers have paved the path for virtual reality as we know it today.

1) Panoramic paintings

If we focus more strictly on the scope of virtual reality as a means of creating the illusion that we are present somewhere we are not, then the earliest attempt at virtual reality is surely the 360-degree murals (or panoramic paintings) from the nineteenth century. These paintings were intended to fill the viewer's entire field of vision, making them feel present at some 1950- Morton Heilig

In the mid 1950s cinematographer Morton Heilig developed the Sensorama (patented 1962) which was an arcade-style theatre cabinet that would stimulate all the senses, not just sight and sound. It featured stereo speakers, a stereoscopic 3D display, fans, smell generators and a vibrating chair. The Sensorama was intended to fully immerse the individual in the film.

Figure 2. Sensorama

Virtual reality in 21st century

The first fifteen years of the 21st century has seen major, rapid advancement in the development of virtual reality. Computer automation, especially small and powerful mobile technologies, exploded while prices are constantly driven down. The rise of smartphones with high-density displays and 3D graphics capabilities has enabled a generation of lightweight and practical virtual reality devices. The video game industry has continued to drive the development of consumer virtual reality unabated. Depth sensing cameras sensor suites, motion controllers and natural human interfaces are already a part of daily human computing tasks.

Recently companies like Google have released interim virtual reality products such as the Google Cardboard, a DIY headset that uses a smartphone to

drive it. Companies like Samsung have taken this concept further with products such as the Galaxy Gear, which is mass produced and contains "smart" features such as gesture control.

Developer versions of final consumer products have also been available for a few years, so there has been a steady stream of software projects creating content for the immanent market entrance of modern virtual reality.

III. METHODOLOGY

360 Degree Video

360-degree video is typically recorded using either a special rig of multiple cameras, or using a dedicated camera that contains multiple camera lenses embedded into the device, and filming overlapping angles simultaneously. Through a method known as video stitching, this separate footage is merged together into one spherical video piece, and the color and contrast of each shot is calibrated to be consistent with the others.
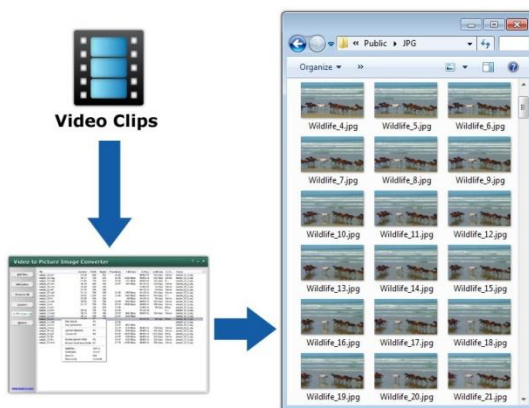
Figure 1. Convertion of frames to 360 degree video.

This process is done either by the camera itself, or using specialized video editing software that can analyze common visuals and audio to synchronize and link the different camera feeds together.

Generally, the only area that cannot be viewed is the view toward the camera support.

VR photography can also be used for displaying objects in 360 (360 photography, commonly referred to as 360 Object VR, 360 product photography, 360 product images and 360 product views). These are created by capturing a series of images as the object rotates over a 360 rotation (camera stays in a fixed position). The output will be a series of individual images (typically JPG format) that can then be composed into an interactive 360 view using HTML5, JavaScript and Flash.

360 Video to VR Video

VR photography, or virtual reality photography, is the interactive viewing of wide-angle panoramic photographs, generally encompassing a 360-degree circle or a spherical view (hence also known as 360-degree [interactive] photo and photo sphere). VR photography is the art of capturing or creating a complete scene as a single image, as viewed when rotating about a single central position. Normally created by stitching together a number of photographs taken in a multi-row 360-degree rotation or using an omnidirectional cameras, the complete virtual reality image can also be a totally computer-generated effect, or a composite of photography and computer generated objects. The history of VR photography is human-computer interaction in which a real or imaginary environment is simulated and users interact with and manipulate that world.

How Virtual Reality video conversion works
1. Install the desired video converter
2. Then you add the video files you want to convert. Most converters detect video files of almost all

formats.

3. Once you're done adding the video files, the next step takes you to the conversion format page: simply put, select 3D Video format/modes or the device for which you want the video to be converted. In our case, 3D SBS video is highly recommended for perfectly playing on Gear VR, Oculus Rift, VR One, Google Cardboard, etc.

Now, just proceed and let the conversion happen. Once done, you can use the file in VR headset with VR player on your smartphone. This is the top method of converting to/from Virtual Reality Videos.

IV. TYPES OF VR

Although it is difficult to all VR systems, most configurations fall into three main categories and each category can be ranked by the sense of immersion, or degree of presence it provides. Immersion or presence can be regarded as how powerfully the attention of the user is focused on the task in hand. Immersion presence is generally believed to be the product of several parameters including level of interactivity, image complexity, stereoscopic view, field of regard and the update rate of the display. For example, providing a stereoscopic rather than monoscopic view of the virtual environment will increase the sense of immersion experienced by the user. It must be stressed that no one parameter is effective in isolation and the level of immersion achieved is due to the complex interaction of the many factors involved.

As will be shown in this report, the type of VR system being used an important consideration when one investigates the genesis of sickness symptoms and the type of symptoms that may develop.

Non-Immersive (Desktop) Systems

Non-immersive systems, as the name suggests, are the least immersive implementation of VR techniques. Using the desktop system, the virtual environment is viewed through a portal or window by utilising a standard high resolution monitor. Interaction with the virtual environment can occur by conventional means such as keyboards, mice and trackballs or may be enhanced by using 3D interaction devices such as a SpaceBallä; or DataGlov .

Semi-Immersive Projection Systems

Semi-immersive systems are a relatively new implementation of VR technology and borrow considerably from technologies developed in the flight simulation field.

A semi-immersive system will comprise of a relatively high performance graphics computing system which can be coupled with either:

- ✓ A large screen monitor
- ✓ A large screen projector system
- ✓ Multiple television projection systems

congestion. The other lanes have their green signals as per their decreasing priorities.

7) This process repeats and the duration of green signal given to each lane keeps adjusting itself after every rotation of the camera.

Fully Immersive Head-Mounted Display Systems

The most direct experience of virtual environments is provided by fully immersive VR systems. These systems are probably the most widely known VR implementation where the user either wears an HMD or uses some form of head-coupled display such as a Binocular Omni-Orientation Monitor or BOOM (Bolas, 1994).

Figure 3. Image courtesy

Jumping forward slightly to 1989, the term Virtual Reality enters our everyday vernacular, thanks to computer philosophy. Even then, the concept of VR remained the same: computer technology is used to create a virtual environment that can be explored and manipulated by individuals.

V. CONCLUSION

This project presents an article on Virtual reality that could change the world. Through full immersion, users can live out stories they've only ever dreamed of, be transported to an exotic place without leaving their house and interact with products as if they were viewing them in actual reality.This kind of changing technology has resulted in different companies offering education to brands on how to use VR and responsive storytelling to better a company's overall brand

1. Participants were likely to spend more time in VR environment compared to online catalog. However, the time extend was not significant.

2. From the results, we found that people remembered and recalled more items in the virtual reality environment.

3. People interests seem to have accelerated more in VR than from the online catalog. It seems that virtual reality can create positive memories and people are more enjoyable in the VR environment.

4. Finally we find that people can interact with items and environment easily and they enjoy the process of interaction. We think that VR is more useful and more usable compared to computers. It is effective and friendly for users to operate and help them focus on their target.

It is reasonable to say that Virtual reality as a marketing tool is able to increase customers' interest compared to the online catalog.

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Transformer Health Monitoring Using GSM and GPS Technology

Prof. Mrs. Archana Shirbhate*, Girish Dhawale, Md.Anwar Ansari, Afsar Mallick, Akshay Amdhare, Tushar Giradkar, Aditya Mahurkar

Department of Electrical Engineering, Anjuman College of Engineering and, Technology, Nagpur, Maharashtra, India

ABSTRACT

Transformers are essential part of the transmission and distribution system. Transformers faults are costly to repair and result in a power loss. So, by regular monitoring it possible to detect new flaws before much damage has been done. Current systems can provide the state of a transformer, but they are offline or very expensive to implement. Proposed system Monitoring equipment that can acquire, process, analyze & communicates the critical parameters to the concerned official who is at a Power distribution grid with the help of GSM and GPS. Not only the conventional technical data, such as current, voltage, etc., but also other critical information such as temperature, humidity, oil level and location of the transformers. So, it is easy to ensure reliable power delivery and to assist the day-to-day decision making activities. Thus, the proposed system increases the reliability of distribution network and offers a more improved transformer monitoring.

Keywords: GSM technology, Micro Controller, Embedded System, Transformer, GPS.

I. INTRODUCTION

In recent years, increased value has been placed on power reliability and economy. Due to major changes in the utility industry there is increased in more economical and reliable methods to generate and transmit and distribute electric power. Due to this reason monitoring the health of equipment to assure that the supply of power can meet the demand. It has been seen recently in northern grid failure on 30th and 31st July 2012 due to inefficient load management functions lead to wider blackout, leaving almost 700 million people without electricity in six northern states of our country. The main focus with transformer monitoring is to protect the transformer against internal faults and

ensuring security to the Transformer. Applying over voltage beyond the nameplate rating can cause a rise in temperature of both transformer oil and windings. If the winding temperature rise exceed above limits, the insulation may fail prematurely. Due to high levels of current flowing through the transformer winding integrity will become weaken. So, A transformer protection scheme needs to include protection against transformer overload, underload and over temperature as well as protection for internal faults.

This proposed system focuses on liquid-immersed transformers because the majority of medium and high-voltage transformers are of this type.

Transformer fault analysis is discussed in section-II, while section III describes about method and material for monitoring of transformer health. Results and discussion is discussed in section IV while Conclusion is discussed in section V.

II. METHODS AND MATERIAL
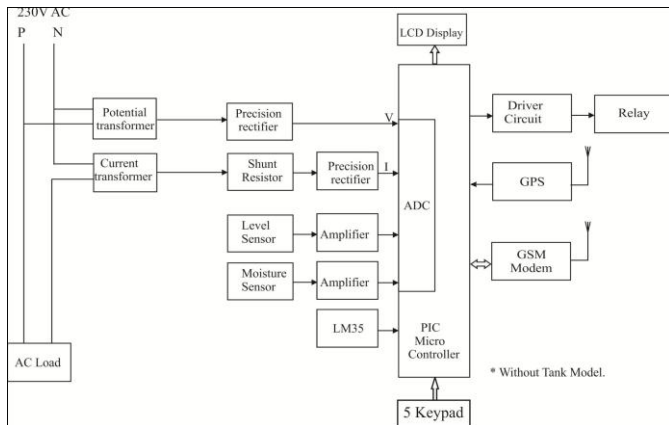
Figure 1. Block Diagram Of Proposed System

Figure 1 It consist of potential transformer, current transformer, temperature sensor(LM35), oil level sensor, micro-controller (PIC16F877A), LCD display, GSM Modem, GPS Module and relay. Normally in transformer, failure occurs due to voltage and current fluctuation, overheating, change in oil level etc. In this project, to sense these fault we have used current and potential transformer, temperature sensor, oil level sensor respectively

All these sensors are connected to converter (ADC) and digital output from converter is given to micro-controller PIC16F877A. PIC has four ports viz. P1, P2, P3 and P0 to which we will be connected to address lines, GSM model and LCD respectively. When fault occurs due to above any reason then change in ratings will be shown on LCD and quick SMS will go to control room via GSM modem along with GPS location using GPS module. A brief

discussion about components used is as given below Sensors play a vital role in effective implementation of the project. As we are interested in monitoring over current, over temperature and oil level following sensors is selected and suitable designed with respect to prevailing conditions of power system and rating of transformer to be protected.

A. Current and Voltage Transformer
Current or voltage instrument transformers are necessary for isolating the protection & control. The behaviour of current and voltage transformer during and after the occurrence of fault is critical in electrical protection since error in signal from transformer can cause mal operation of the relays.

B. Oil Level Sensor
Oil level sensor is float connected angular potentiometer. Float is immersed in oil and its mechanical output is given to angular potentiometer. When there is any mechanical movement of float, there is voltage generation corresponding to mechanical movement of float. That voltage is used for oil level monitoring.

C. Micro Controller
Operating speed: DC - 20 MHz clock input
Up to 8K x 14 words of Flash Program Memory,
Up to 368 x 8 bytes of Data Memory (RAM)
Up to 256 x 8 bytes of EEPROM data memory
5V source needed for programming capability

D. GSM Modem
A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone.

E. LM 35 Temperature Sensor
LM35 are used to sense the heat and an IC ADC0808 is used to convert the data into digital. LM35 digital sensor has got 3 pin's i.e., VCC, GND and output pin's when LM35 is heated the voltage at output pin increases, it is connected to the analog

to digital convertor IC (ADC). The LM35 series are precision integrated-circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature. The LM35 thus has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling.

III. RESULTS AND DISCUSSION

The project is based on microcontroller programming. The program for microcontroller in embedded C language. Program written burned into microcontroller and saved as Hex file. For PIC16F877A controller Atmel programmer is used. Program hex file is compiled in µcontroller MPLAB compiler. This compiler converts program into machine language code as well as check program for error if any error found notifies and these errors are corrected manually. Then it successfully executed in compiler. After compiling program in µcontroller flash compiler, it is burned into PIC16F877A microcontroller with the help of universal program burner kit FP8903 programmer which is connected to computer. After successful program burning, microcontroller becomes ready for use. In testing, after successful program burning, microcontroller is mounted on its base and kit becomes ready for testing. For testing in program kit has provided with following four parameter of transformer:

1. 180 >Voltage > 260 ---- Voltage Fault
2. Temperature > 400C---- Temperature fault
3. Power > 125W ----- Over load
4. Oil level < 10 ml ---- Oil level fault

Therefore any change occurred in above rating during running of project model, these changes is shown in LCD and same data obtained in SMS and at the same time transformer gets disconnected from supply with the help of relay.

IV. CONCLUSION

Transformers are among the most generic and expensive piece of equipment of the transmission and distribution system. Regular monitoring health condition of transformer not only is economical also adds to increased reliability. In the past, maintenance of transformers was done based on a pre-determined schedule. With the advancement of communication technology now it is possible to receive fault information of transformer through GSM technology remotely to the operator and authorities so one can able to take possible solution before converting fault in to fatal situation. Depending upon fault analysis a prototype model of microcontroller based transformer health monitoring kit is developed in laboratory. Using digital controller analysis results are regularly updated. During abnormal conditions exceeding specified limits information is immediately communicated through GSM technology to the operator and also to concerned authority for possible remedial action. This type of remote observation of health condition of transformer not only increases the life of transformer increases mean down time of transformer there by increased reliability and decreased cost of power system operations.

V. REFERENCES

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An Energy Efficient Multilevel Priority Packet Scheduling Scheme for Wireless Sensornetwork

Chetana Samundre, Rajshri Suryavanshi, Disha Kathane, Tejshree Pandit

ABSTRACT

Wireless sensor network(WSN) consist of compact distributed self-organizing wireless nodes with small amount of CPU memory, low processing power and low battery capacity. The wireless nodes generates different types of data packets such as real time and non-real time data packets because it sense environmental situations.

WSN uses most existing packets schedul-ing system i.e. First come first serve(FCFS).In FCFS concept the data packets which enter the node first will leave the node first. In this process there might be starvation of real time data pack-ets because data packets are processed ac-cording to the time but they are not pro-cessed according to priority.

Scheduling different type of package in WSN is highly important since it ensure deliver of different type of packets based on their priority and fairness with minimum latency.

Keywords: FIFO,Wireless Sensor Net-work,data waiting time, real-time, non-real-time, packet scheduling.

I. INTRODUCTION

Wireless sensor networks (WSN) consist of more than hundreds of small spatially distributed autonomous devices using sensors called sensor nodes to monitor the physical and environmental situations such as sound vibration, temperature, pressure, motion and intensity of light[1]. WSN has gained a great value and importance due to flexibility, cheaper implementation cost, mobility etc. The sensor networks are expected to play increasingly important role in future especially in monitoring and military applications on large scales and it consists of small and inexpensive sensor nodes that have limited memory, limited computing power, and that operate using batteries[2].

Scheduling of different packets at the sensor nodes is very important as ensures the delivery of the data packet on the priority basis. The sensed data may be real time or non-real time. Highest priority should be given to real time data sense by the node compare to non-real time data packet. Sometime the nodes may be put to sleep mode, when there is no data packet available and as soon as the data packet arrives at the node is putted into wake mode. This reduce the sensor node energy consumption[3].
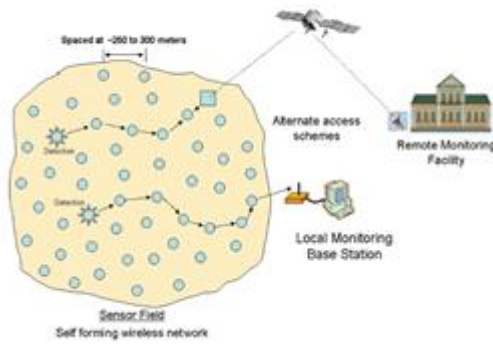
Figure 1. Diagram of energy efficientmultilevel priority packet scheduling scheme for WSN

Sensor nodes are smart, small in size light weight that monitor physical and environmental situations. The data sensed at the wireless sensor nodes is to be sent to a base station nodes via LAN connection that connects all the nodes of WSN that uses very less bandwidth base station collect the data from various nodes using single hope transmission and sometimes multi hope transmission.

The packet scheduling scheme for WSN, in which overcome all drawback occurred in existing scheduling algorithm. The DMP packet scheduling scheme for WSN, in which sensor nodes are virtually organized hierarchical structure. In DMP packet scheduling scheme for WSN, where each node maintains three level into its queue for three different types of data packets. This is because we classify data packets as (1) real time (highest or priority1), (2) non real time remote packets i.e., packet that arrive from the sensors nodes at lower level (priority 2), and (3) non real time local packet(lowest priority 3). Non-real time data packets are classified based on the location on sensor nodes to balance to end-to-end delay of data packets that are generated at different locations. Non-real time data traffic with the same priority are processed using the shortest job first (SJF)

scheduler scheme since it is very efficient in turns of average task waiting time[4].

II. RELATED WORK

In this section, we define the following terminologies and factors that are used in packet scheduling scheme.

Earliest Deadline First (EDF)[4]: Whenever a number of data packets are available at the node and each packet has a deadline within which it should be sent to base station. The data packet which has the earliest deadline is sent first. Data that have travelled the longest distance from the source node to base station and have the shortest deadline, are given highest priority. If the deadline of a particular data packet expires, the most suitable data packets are send at an intermediate node.

First Come First Serve (FCFS)[4]: The first come, first served scheduling system is the simplest scheduling system in which packets are processed as they come. It is the method that was used to support real-time communication. In this scheduling system it might be possible that the data packet that should reach base station as early as possible take time. Therefore to avoid time consumption the data packets are prioritized. Packet Type Packet scheduling schemes can be classified based on the types of data packets, which are as follows.

Real-time data packets[4]: Packets at sensor nodes should be scheduled based on their types and priorities. Real-time data packets are considered as the highest priority packets among all data packets that are present at the node. Hence, they are processed with the highest priority and delivered to

the base station with a minimum possible end-to-end delay.

Non-real-time data packets[4]:-Non-real time data packets have lower priority than real-time data packets. They are hence delivered to BS either using first come first serve or shortest job first basis when no real-time packet exist sensor node.

III. PRELIMINARIES

In This section, we define some of the Terminologies and genera assumptions which areused in designing the Dynamic Multilevel priority (DMP) Packet Scheduling Scheme[4].

Assumptions

- ✓ We make some of the following assumptions to design and implement DMP packet Scheduling Scheme.
- ✓ Only real time data packets and non-real time data packets are present in the data traffic medium for e.g. non-real –time data sensed by temperature data and real-time data body sensors.
- ✓ Both types of data packets are of same size i.e. real-time and non-real –time.
- ✓ In the network all sensors node are time synchronized.
- ✓ For real- time data there is no data aggregation is performed at intermediate nodes.
- ✓ Depending upon the Number of hop counts nodes are considered located at different levels.
- ✓ By Using TDMA scheme timeslots are located to nodes.
- ✓ Each sensor nodes have ready queue which is divided into three individual queues only (For real –time data pr1, For non-real-time data pr2 and non-real-time local data pr3.

- ✓ The length is variable for data queues in sensor nodes. For instant pr1 length is smaller than pr2 and pr3 queues are same[5].

IV. TERMINOLOGIES

In this section, we described the following factors and terminologies which are important in designing the DMP packet Scheduling scheme[5].

Routing protocol

Routing protocol in which network is a virtually arrange into a hierarchical structure, considering base station act as the root node, and the sensor nodes that are adjacent to the base station are deem to be at level and nodes in zone with hop distance of 1 from base node are refer to be at level1 and so on, and nodes which are situated at the boundry are called as leaf nodes. To avoid complete depletion of Energy of a sensors node, a Zone-based Routing protocol is used[4].

TDMA scheme

Packet or Task Scheduling at every nodal level is done using a Time Division Multiple Access(TDMA) scheme. Every level in the Routing protocol is distributed with a time slot. There is a variation of time slots. In the design of DMP scheduling variable time slots are used because nodes at lower levels have more number of packets as compared to the nodes which are far from the base station. Considering the Observation, the length of time slots at upper-level nodes is set to a higher value[5].
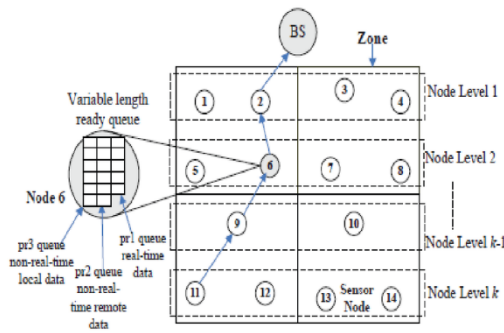
Figure 2. Proposed dynamic multilevel priority (DMP) packet scheduling scheme

Round-robin scheduling within the Queue-Depending on the scheduling the DMP packet scheduling, Data packets i.e. real-time and non-real time data packets are scheduled among the multiple queues. Existing scheduling technique are SJF and FCFS scheduling within in queue of these scheduling techniques of starvation free, so we propose a round robin scheduling neither round robin approach. In this approach the ready queue is performed as circular queue.

Following are some observations of Round robin:
By default it is preemptive algorithm rather than non-preemptive.

For processing at least once it allocates CPU to a packets in a row[5].

V. PRIORITY

As we discussed before, there are two types of data packets, in which real-time data packets and emergency data should have highest priority and non-real-time data packets is transfer the priority depending on the sensed location and size of data. The data packets that are received by node n from the lower level are given highest priority. however, If it is noted that the lower priority non-real timer local data cannot be transmitted due to continuous coming up of higher priority and non-real-time remote data, they are preempted to allow low-priority data packets to be preserve after a inescapable waiting period[5].

FAIRNESS This metric convince hat packets of extraneous priorities find out with a minimum waiting time at the ready queue based on the priority of tasks or packets. For instance, if any lower-priority packets waits for a long period of time for the continuous reach of greater-priority packets, fairness defines a constraint that permit the lower-priority packets to attain processed after a secure waiting time.Location on sensor nodes to balance to end-to-end delay of data packets that are generated at different locations. Non-real time data traffic with the same priority are processed using the shortest job first (SJF) scheduler scheme since it is very efficient in turns of average task waiting time

VI. CONCLUSION

An energy efficient multilevel priority task scheduler has better than FCFS, and multilevel queue scheduler in terms of average task waiting time, both for real-time tasks, and all types of tasks. Using the concept of three level priority queues at each node, the proposed DMP task scheduling scheme allow different types of data packets to be processed base on their priorities. Dynamic Multilevel Priority (DMP) packet scheduling scheme, its prerequisites and the factors that are being considered in the algorithm. This paper deals with issues such as – how the starvation of both types of data packets is avoided, how the processing overload, average end-to-end delay is reduced for the delivery of both real-time and non-real-time data packets. We studied the DMP packets

scheduling scheme that improves the overall performance of scheduling in a WSN[4].

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Online Chatbot System

Tejashwini Mushinamwar, Prof R. R. Kolte, Ashwini Gawande, Kirti Mendhe, Neha Tarare
Department of Information Technology,RTMNU University, Nagpur, Maharashtra, India

ABSTRACT

A chatbot is a technique used in android and Web based technique. The basic feature of chatbot is, it replies properly for the queries given by the end user. We try to extract the best pairs of chatbot knowledge from online communication which leads to get knowledge more from a specific area, we used based classification by related threads. We give ranks for the pairs squirm from the online discussion. Finally we select top most N pairs for the chatbot knowledge which helps for better communication of end user and this
Keyword: Artificial Intelligence,Best Pair, Knowledge,Ecommerce.

I. INTRODUCTION

Chatbot is an agent conversation that gets interact the user and a domain,with simple language sentence for a specific topic[4].User works with the chatbot for any information, many chatbot are available in internet for frequently asked questions or to start some new topics but has some websites has strict restrictions to access. The existing chatbots are ELIZA,PARRYY,and LCC, in all these existing chatbots dialog management modules are present to control the knowledge base and process feature. Currently the templates used in chatbots are hand coded. Since it is hand coded, the knowledge bases needs move time and and also adaption of this is very difficult.

II. RELATED WORK

The initial Chatbot named as ELIZA follows keyword matching technique, it will take the input from the user and find out a specific pattern then it retrieve the answer. If the particular keyword is not found, it will get more information from the user which makes user alive [2].

Artificial Intelligence Mark-Up Language (AIML) files are used to pattern matching. The main use of AIML is to have normal communication with the user.Hike android application uses Natasha for live assistance, it uses predefined intelligent way, it is an entertainment usage. If the user gets bored they can communicate via Natasha [5].

In all the above said existing system, ELIZA doesn't understand what it is saying. Based on the rules it will produce results. ALICE doesn't have the ability to learn and can only come with data that exist in its database [1].

III. PROPOSED SYSTEM

A Proposed System The in order to demonstrate the concept of the project we will design an E-

Commerce Website that has a catalog of products that can be browsed. The website itself is designed so it can be integrated entire with the chatbot. The website has traditional navigation options for the user if he or she desires to browse the website, in a courteous manner. It will also feature conventional search/filter options. This website will have an courteous chatbot that can be accessed from any page. The user can interact with the bot using Natural Language. The bot can make suggestions, give information or ask further questions to elicit further information depending on the user interaction. The bot has a minimum response time.
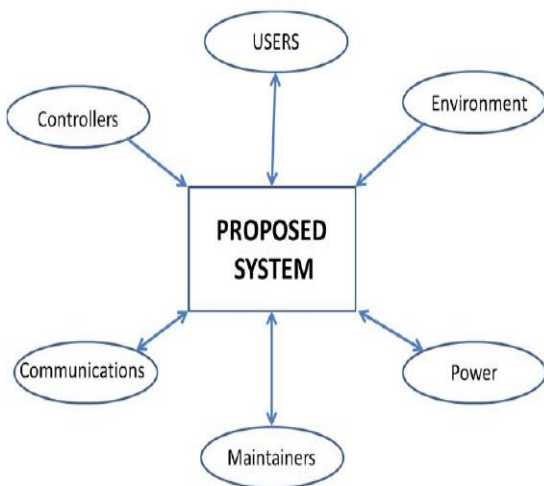
Figure 1. Proposed system

IV. INTERACTION WITH USER

The user can access the website through his/her android device and it will have a chat system with the bot. Any requirement of the user can be directly entered into the message window. The chatbot takes this input and matches it with the pattern matching programmed and it will give out responses. If the response that is returned is matching the needs of the user, he/she can click on 'YES' and the product will be added to cart. After this point, payment for the same can be made.
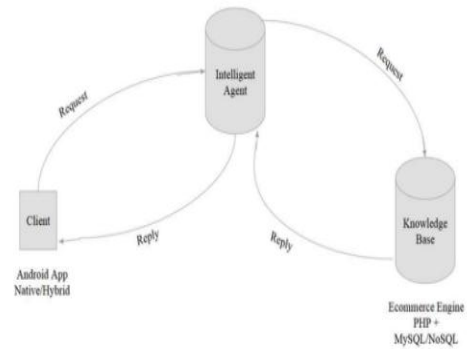
Figure 2. Three- Tire Architecture of chatbot

V. IMPLEMENTATION PLAN

The Implementation Plan of the entire system is divided into three tiers, which are to be done sequentially.

The architecture of the system is as shown in the figure 2.

Input controls or other widgets that draw some part of the UI. this hierarchy tree can be as simple or complex as you need it to be but simplicity is best for performance [9].
The Three-Tire Explained as follows:

5.1.Anroid: All user interface elements in an android app are built using View and ViewGroup objects. A View is an object that draws something on the screen that the user can interact with.A ViewGroup is an object that holds other View (and ViewGroup) objects in order to define the layout of the interface. android provides a collection of both View and ViewGroup subclasses that offer you common input controls (such as buttons and text fields) various layout models(such as a linear or relative layout).

5.2.Intelligent Agent: An agent will gather information and perform the necessary services without your immediate presence and on some

regular schedule. Typically, the agent program will use the parameters you have provided, will search all or some part of the engine, gather information you're interested in,and present it to you when you ask for it. A simplified architecture and working of the agent that will be used as
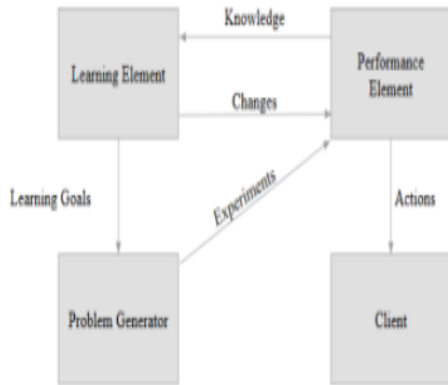
Figure 3. Architecture of Intelligent Agent

VI. COMPONENTS

There are two components website and Chatbot. they are integrated to provide a good user experience.

1.Website: The website is coded in HTML/CSS with PHP used for scripting. The website has a MySQL database that stores the product details and inventory.

2.Chatbot: The chatbot utilizes Rivescript, to fetch responses based on user input. Rivescript is a simple scripting language for giving intelligence to chatbots and other conversational entities. It's a plain text, line-based scripting language with goals of being simple to learn, quick to type, and easy to read and maintain. [11]

VII. WORKING

In order to implement the dynamic functionality, the server contains a PHP file that serves as a medium of interaction between the Chat Client and the MySQL database. When a trigger that contains an object macro is called, the response is parsed and then executed by the Interpreter's Javascript Object handler. The response makes an AJAX request to the PHP page, and on receiving a response, displays it within the chat window. This response contains a hyperlink to the respective product pages of the suggested products.

Figure 4. Sample conversation between user and the bot.

VIII. CONCLUSION

The Chatbot will use artificial intelligence and hence will learn the responses of the users resulting in increasing efficiency. Chatbot will have the ability to respond like human being hence it will ease the efforts that are required to be done by human.so, in this paper, we have planned to implement an Ecommerce engine based Chatbot which will attempt to improve the interaction of the user with E-Commerce engine.

Chatbot will store a set of responses, but also will take dynamic user input into account and thus its to provide relevant responses and product suggestions.

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Solar Based Dual Air Conditioning System Home Application

**Amrin Ayyub Khan [1], Aafsha Ruhi Khan[1], Abhishek Marsattiwar[1], Vaseem Sheikh[1], Chetna Bhadang[1],
Sagar Mishra[1], Ashar Khan[1] , Prof. Irfan Ahmed[2]**
[1]B.E. Student, Department of Electrical Engineering, A. C. E. T. Nagpur, Maharashtra, India
[2]Associate professor, Department of Electrical Engineering, A. C. E. T. Nagpur, Maharashtra, India

ABSTRACT

With advancement of new technology and inventions , the focus is done on the use of renewable source of energy. Use of solar energy is one of the modern way of heating as well as cooling. This paper presents the modification of domestic cooler into solar based dual air conditioning system foe home applications. Thus the system is able to work throughout the year by providing cool air in summer season and warm air in winter season. Apart from dual function conditioning, speed controlling is also done in the system. The speed control is provided with the help of Arduino ATmega328 making it easy for the people to operate as maximum work is done using microcontroller, The only manual task is to provide sheet for heating in winter season.
Keywords: PV Panel, Arduino, MATLAB Simulation, DC Motor.

I. INTRODUCTION

Solar air conditioning refers to any air conditioning system that uses solar power. The conversion of solar energy into electrical energy can be done through passive solar, solar thermal energy conversion and photovoltaic conversion, we are using photovoltaic conversion for this air conditioning system. U.S. Energy Independence and Security Act of 2007 created 2012 funding for a new solar air conditioning research and development program, which should develop and demonstrate multiple new technology innovations and mass production economies of scale. Solar air conditioning might play an increasing role in zero energy plus buildings design. Solar Photovoltaic (PV) system convert solar energy directly into electrical energy. The basic conversion device used

is known as a solar photovoltaic cell or a solar cell. A solar cell is the most expensive component in a solar (PV) system (about 60% of the total system cost) though its cost is falling slowly. Commercial photocells may have efficiencies in the range of 10-20% and can produce electrical energy 1-2 kwh per sq. meter per day in ordinary sunshine. Room occupants also add heat to the room since the normal body temperature is much higher than the room temperature. Need of such a source which is abundantly available in nature, which does not impose any bad effects on earth. Thermal comfort is determined by the room's temperature, humidity and air speed. Radiant heat (hot surfaces) or radiant heat loss (cold surfaces) are also important factors for thermal comfort. Relative Humidity (RH) is a measure of the moisture in the air, compared to the potential saturation level. The solar based dual air

conditioning system have complete application in bright sunshine days but if any fault occurs in panel or for maintenance and in rainy days a provision of auxiliary supply source is made. This project is also concentrated upon the speed control of the motor using arduino. The control and regulation is made possible and hence it gives a better efficiency to the system than any traditional domestic cooling system. A complete block diagram is as shown in the figure.
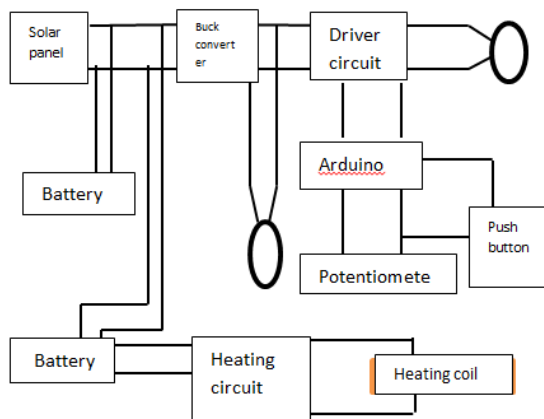
Figure 1. Block diagram of solar based dual air conditioning system.

II. COOLING PROCESS OF SOLAR COOLER

The solar based dual air conditioning system can be mainly operated for cooling purpose in humid condition. The construction and working of cooler is simple as that of normal domestic cooler. The main advantage of this cooler is that it uses solar energy for it's complete mechanism and Arduino posrt. The Arduino provide speed control to the motor which is not possible to regular domestic cooler. The performance efficiently by using the circuitry as basic converter, driver circuit, Arduino, potentiometer has increased. The air is drawn from atmosphere which is cooled by a honeycomb structure placed on backside of the complete hardware of cooler when that structure rotates the

water in the task also actuate and produce cool air. The main advantage of solar based dual air cooler system is that there is no requirement of any pump for the circulation of water. The cold air is thrown out from the outlet. The push button is placed along with potentiometer for forwarding and reversing of the motor. When forward push is ON the potentiometer produces analog signal converting into digit from by Arduino the speed control can also be done easily. Hence cooling for solar based dual air conditioning system is achieved by solar panel and also battery as an auxiliary source of power.

Main components used are :

1. Photovoltaic panel
2. Battery
3. Buck converter
4. Driver circuit and Arduino port
5. Potentiometer and push button
6. DC motor

1. PHOTOVOLTAIC PANEL : In order to create low power remote and independent electronic devices it is necessary to collect and convert energy directly from the environment .the PV system directly converts sunlight into electricity by photovoltaic effect. The voltage current available at the terminals of PV device may directly fed small loads such as lighting system and DC motors. PV cell is basically a semiconductor diode whose PN junction is exposed to light. Different types of PV cell available at commercial scale are: monocrystalline and polycrystalline. The major advantage of using PV cells are :

1) Short lead time for designing and installing new system.
2) Output power matching with peak load demands.
3) Static structure.
4) Longer life.

5) High power capability per unit of weight.
6) Inexhaustible and Highly pollution free.
7) Mobile and portable and produce no noise.

Solar cell efficiency vary from 6% for amorphous silicon based solar cell to 42.8% with multiple junction research lab cell. For commercial purpose multicrystalline PV cell efficiency varies from 14-19%. Efficiency of a PV device is dependent on the spectral distribution of solar radiation.

The characteristics of PV cell is mainly dependent on three parameters:

1) Open circuit voltage Voc : Voc varies little with solar radiation change, a rise in temperature produces decrease in voltage.
2) Short circuit current Isc: It is directly proportional to solar radiation and is relatively steady with temperature variation.
3) Maximum power point MPP: for best utilisation PV cell must be operated at their MPP, it varies with illumination , temperature radiation dose and other effect.
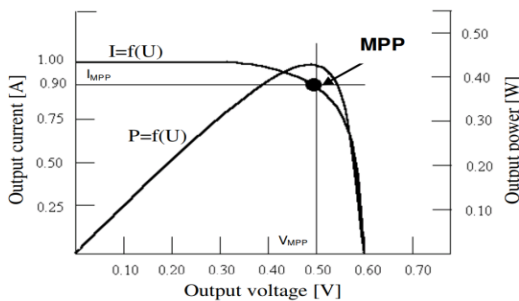
Figure 2. Typical I-V and P-V characteristics of photovoltaic cell.

PV cell modelling:
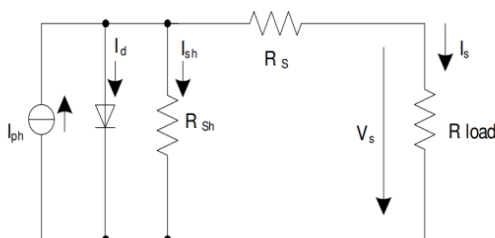
Figure 3. The equivalent circuit for the one diode model.

The simplest way of representing solar cell is single diode model. It consist of current source in parallel to diode. The parameters required are short circuit current Isc, open circuit voltage Voc and diode ideality factor a. The ideality factor of a diode is a measure of how closely the diode follows the ideal diode equation. A single PV cell is realised as a current source placed in parallel with a diode and ideal output current equation is given as:

$$I = I_{ph,cell} - I_{o,cell} [\exp(\frac{qV}{akT})-1] \qquad ......(1)$$

Practical equation is given as :

$$I = I_{ph,cell} - I_{o,cell} [\exp(\frac{q(V+IRs)}{akT})-1] - [\frac{(V+IRs)}{Rp}] \quad ......(2)$$

Where: I_{ph} = photo voltaic current, I_o =saturation current of the diode, q=electron charge in coulombs =1.602*10-19C, K=Boltzmann constant =1.380*10-23 J/K, a=diode ideality factor, Rs=series resistance ,Rp=parallel resistance ,T=Temperature in Kelvin.

The photo voltaic current Ipv is a function of the irradiance (G) and is formulated as:

$$I_{ph} = [I_{ph\_STC} + K_i\Delta T] (\frac{G}{G\ STC}) \qquad ....(3)$$

Where; I_{ph_STC}=light generated current under standard test conditions (STC) ,ΔT= T-T_{STC} (in kelvin), G= surface irradiance of cell (W/m2), G_{STC}=1000W/m2, Irradiance under STC Ki = short circuit current coefficient.

The diode saturation current Io is given as:

$$I_o = I_{o\_STC} (\frac{T}{T\ STC})^3 \exp[\frac{qEg}{ak} (\frac{1}{T\ STC} - \frac{1}{T})] \qquad ....(4)$$

Where: I_{o_STC} = normal saturation current under standard test conditions (STC) ,T_{STC}= temperature under standard test conditions ,Eg= band gap energy of the semiconductor.

2. BATTERY : The solar based dual air conditioning system have complete application in bright sunshine days but if any fault occurs in panel or for

maintenance and in rainy days a provision of auxiliary supply source is made. The most prominent source of auxiliary supply used is lead acid battery.(The rechargeable and portable battery having the ratings as 12V ,7.5Ah).

3. BUCK CONVERTER :

Buck converter is placed after positioning solar panel supply and battery supply (which is a auxiliary DC form of supply to the system). The simulation of the chopper is done on the software MATLAB r2017a. The conceptual model of the buck converter is best understood in terms of the relation between current and voltage of the inductor. The buck converter for solar cooler here is made by using capacitor of 100μF, inductor 100μH, capacitor 1000μF with IC LM2576T and diode IN5822. The buck converter is used in the circuit in order to control voltage level. 18 V DC is obtained from solar panel which in terms used for the air conditioning. The fluctuations in voltage level can cause problem in motor circuitry and other components like arduino and driver circuit etc. Hence buck converter is used to control the excessive voltage level and providing required voltage by buck down unnecessary increased voltage. The voltage range of buck operation is adjusted at 12V. If voltage range cross this value then it buck that voltage smoothening the operation. The complete operation is done through simulation on MATLAB and control is provided through arduino making it more user friendly. The MATLAB model of the buck converter along its waveform is explained here.

Graphical output obtained after simulation :

4. DRIVER CIRCUIT AND ARDUINO :

There are several ways of making the driver circuits using transistors, L293D/ L298N, Relays. Out of which L298N is preferred as it is very popular Dual H-Bridge Motor Driver IC. This module allow easy and independent of control two motors up to 2A each in both directions. Normal DC motors requires current greater than 250mA. ICs like 555 timers, ATmega16 Microcontroller, 74 series ICs cannot supply this amount of current. If it directly connect motors to the output of any of the above IC's, they might get damaged.

There is a need of a circuitry that can act as a bridge between the above-mentioned ICs and the motors. L298N driver circuit independently control two motors in both clockwise and anti-clockwise direction of rotation. Continuous maximum output current per channel is 2A, Peak maximum output current per channel (<100μs) is 3A as per the requirement. Driver circuit takes input from buck converter and is mainly used to limit the fluctuation and harmonics produced due to the operation of arduino for motor control.

The Arduino Uno has a number of facilities for communicating conversion with a computer. Arduino uses a hardware known as the Arduino development board and software for developing the code known as the Arduino IDE (Integrated Development Environment). The ATmega328 provides UART TTL (5V) serial communication,

which is available on digital pins 0 (RX) and 1 (TX). An ATmega8U2 on the board channels this serial communication over USB and appears as a virtual com port to software on the computer. The Arduino Uno can be programmed with the Arduino software, It communicates using the original STK500 protocol. The speed control of the cooler can be done by using Arduino which require following ratings of the components with different range of operation. Microcontroller ATmega328 with Operating Voltage 5V. The recommended input Voltage is 7-12V in limit with 6-20V. Digital I/O Pins 14 (of which 6 provide PWM output) and Analog Input Pins are 6. DC Current per I/O Pin 40 mA DC Current for 3.3V Pin 50 mA.The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5V pin may supply less than five volts and the board may be unstable. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts. The input voltage to the Arduino board when it's using an external power source is Vin. The regulated power supply used to power the microcontroller and other components on the board which can supplied by USB or another regulated 5V supply and Maximum current draw is 50 mA. The complete speed control action is done using Arduino ATmega328. Driver circuit take input from buck converter which is adjusted at the voltage of 12V. if ardunio is directly connected to motor it will damage the port and system will collapse. Driver circuit placing in between this two can help in performing the smooth speed control operation.

5. POTENTIOMETER AND PUSH BUTTON : Push button which is operated for forwarding and reversing of the motor plays an important role in the system. Potentiometer is used to provide signalling to the arduino port. Potentiometer which is operated manually is provide pulse width

variation to give voltage variation for speed controlling. Hence PWM method can be achieved so as to perform proper heating and cooling operation.

6. DC MOTOR : PMDC motor is highly efficient since no electrical energy is used or losses incurred for developing or maintaining motor's magnetic field. Its size is more compact and a better dynamic performance can be expected due to higher flux density in air gap. PMDC has an essentially simplified construction and is maintenance free. An increase in torque requires a decrease in angular velocity and vice versa. Complete system of air conditioning system is work on 12V which is required to rotate the fan.

III. SPEED CONTROL OF SOLAR COOLER

Armature resistance control of DC Motor is a conventional method to control speed by varying the armature circuit resistance. The voltage drop in the variable resistance reduce the applied voltage to the armature, as a result, the speed of motor is reduced. But, the main hindrance is with change in resistance parameter which increases losses proportionally. So as to minimise this losses in solar based air cooling, voltage control method is used. Arduino port which is a multi-purpose device is mainly used for speed control by varying voltage levels so as to provide automatic and advance mode to the system. Hence the complications of controlling the speed of solar based dual cooler has successfully performed. The PMDC motor having simple construction can be easily controlled by Arduino and driver circuit. A purposeful isolation between Arduino and motor via driver circuit is provided hence efficiency of the system is obtained more than resistance speed control method. Solar based dual air conditioning system have arduino ATmega controller which is a multifunctional

device. The basic concept of operation is based on signalling provided to the arduino. Potentiometer is used to vary the signals which control the speed of motor.

The speed controlling of dual solar based air cooler can be done through pulse variation. The potentiometer is provided with voltage level variation control which level variation control with voltage level variation control which gives analog signal to the Arduino. For a particular speed of operation, the analog signal provided to the port is converted into a digital signal and through programming speed of motor can be controlled. Programming on Arduino can be easily done through Arduino software. ATmega 328 is loaded with a DFU boothloader, which can be activated by connecting the solar jumper on the back of board and then resulting the 8U2. Pulse Width Modulation (PWM) process for speed control of a DC motor can be achieved through programming on Arduino quite easier and modern method of operation.

IV. HEATING MECHANISM OF SOLAR COOLER

The mechanism of heating of Solar Based Dual Air Cooler consist of simple construction and working. Sensing temperature so as to work for the better atmospheric condition tripping timer or temperature sensor can be used. After attaining a particular room temperature the tripping circuit operate at t=0. The mechanism works as when temperature goes down a certain value, it will trip for heating circuit and if temperature is increasing beyond it's specific configuration, it will close the cooling circuit and opens heating circuit at t=0. As the performance is based on both cooling and heating application, air heating also possesses a

relevant task along with an air cooling. For heating the requirement of load is more than that of cooling, hence battery is needed. In the process of heating, there is a tunnel which is made up of aluminium sheet, attached horizontally to the centre top of the cooler. The reason behind using aluminium sheet is the melting point (660.3℃) which is perfect for the heat dissipation without any setback. The DC coils generates intense heat until its sufficient for the surface of heating the aluminium sheet. The DC coil used in car for cigarette combustion heats the aluminum sheet in which it is wounded. Generally 4-5 DC coils on same proportion of aluminum sheet are placed which when heated produced hot air which moves upward by rotation of centrifugal fan & further heated to an extent at the mouth of fins. The hot air is thrown out from the opening mounted on head of the cooler in a managed proportion. This process require a requisite time to perform and consequently both the purpose & consequently both the purpose of cooler are obtained.

V. CONCLUSION

Simulation tools are very mandatory for developing and handling mathematical simulations for analysing the behaviour of PV system and buck converter. They embolden the process of progressing the study of new system like power converters etc. for reducing cost and time. In this paper the study on the mathematical modelling of PV array, buck converter, speed control mechanism using microcontroller is studied and applied. This cooler is most efficient device for domestic cooling and also serves the purpose of energy saving.

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A Review on Iot Based Irrigation System

Rofina Anjum[1], Punam Mhaiske[1], Farha Siddiqui[1], Shraddha Khonde[1], Prof. M. Nasiruddin[2]
[1]B.E Student, Department Of Electronics & Communication Engineering, Acet, Sadar Nagpur, Maharashtra, India
[2]Hod & Associate Professor, Department Of Electronics And Telecommunication   Engineering, Acet, Sadar Nagpur, Maharashtra, India

ABSTRACT

Agriculture plays important role in the development of agriculture country. Difficulty regarding agriculture have been always hamper, slow down the development of the country. The only solution to this difficulty is advance agriculture by modernizing the present traditional system of agriculture. The underline feature of this project incorporate advance IOT module based controlled to perform function like moisture sensing, spraying, and irrigation. It incorporate advance irrigation with advance command, control intelligent and alert decision making based accurate real time area information. Even with the advance made in the application of IOT based agriculture having important opposition to control this condition incorporate; first is combination of current IOT solution by IOT based architecture, platform and standards. Second is up scaling the usage of correspondence IOT technologies afar early adapt mainly the simplification of current solution and make it reasonably for end users.

Keywords: ATmega328p, IOT module ESP8266, dry/wet sensor.

I. INTRODUCTION

Agriculture is the major pillar of Indian economy. Bulk of the obtainable fresh water agency are use in agriculture. In India most of the irrigation arrangement are handled physically which is not automated. In the recent year automated and semi-automated system been developed for irrigating the area which has replaced the traditional agriculture mechanism. The current irrigation methodology choose employ constant water handling which is not optimal. So properly technologies being put in towards agricultural observing which is required by farmers. In addition to employing technology in

observing the agriculture for automating the irrigation structure there is need for some intelligence which permits machines to put in some intelligence in understanding agricultural information expressed and properly and study information towards predicting the output rather than following traditional command based algorithm. So it is clear that wireless base system and machine learning have been employed in agricultural monitoring pertaining to crop selection and yield, crop disease prediction.

India is agriculture oriented country. In this different tools and techniques are available for

development of farming. As we know that the population is increasing day by day so there will be more requirement of food on earth. To meet this demand farmers and agricultures are turning towards internet of things for greater production capabilities. Internet of things can play a big role in increasing productivity, obtaining huge global market idea about the trends of crops. Internet of things is a network which can be used without human involvement.

Today many agricultural industries are turned to internet of things based for smart farming to enhance the productivity, global market and other features like less human efforts ,time and cost.

As we know traditional farming will damage the production and less grains are taken out by the use of traditional farming. So, we cannot reach the demand up to that level. That's why industries are moving towards IOT base technology to have a smart farming and to get a more production. Focusing on encouraging innovation in agriculture, smart farming is the answer to the problems that this industry is currently facing all this can be done with the help of smart phones and IOT devices. By the use of this farmers can get any data and information and can monitor his agriculture sector.

II. PROPOSED SYSTEM

India is agriculture oriented country. In this different tools and techniques are available for development of farming. As we know that the population is increasing day by day so there will be more requirement of food on earth. To meet this demand farmers and agricultures are turning towards internet of things for greater production capabilities. Internet of things can play a big role in increasing productivity, obtaining huge global

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Figure 1. Proposed Iot Based Irrigation System.

Figure 1.1 the irrigation switch using atmega328p is plan to tackle the difficulty of agricultural section respecting irrigation system with available water resource. Prolonged periods of dry climatic problems due to variation in annual precipitation, may considerably reduce the supply of the cultivation. The outgoing in establishing many of this crops and their relative intolerance to shortage of water make an effective irrigation system a necessity for profitable enterprises. In this project we are using ATMEGA328p, Moisture sensor, AC submersible pump. A submersible motor will get switched ON/OFF depending on the volumetric water content soil moisture condition and status of motor can be displayed on 16x2LCD. An IOT module is interfaced to the controller to update the information in the web server about the condition of the area.

III. OBJECTIVE

a) To improve the implementation of the IOT switches with the help of atmega328p processor
b) To design and implement the WIFI system with help of sensor and display LCD 16*2
c) This design and implementation of IOT which helps to maintain the water management with the help of sensor.

The main objective to perform this IOT based advance farming to get a good amount of production with less human effort and climatic distortion.

IV. RELATED WORK

The sensors and devices which are interconnected to each other with one central server via wireless communication [1].The IOT combines the ideas internet and things and can therefore semantically be defined as a world-wide network of interconnected object uniquely addressable, found on standard communication protocol. For agriculture in usual several papers focus on accurate agriculture or sensing and monitoring the production environment['2].The main responsibility of sensing layer is to achieve automatic and real time conversion of the physical amount of real-world agriculture production into digital information that can be processed in virtual word through various means[3]. Sensor based paddy growth monitoring system [4] been developed by researchers kit toward improving the rise productivity. The structure has been considered to be cost effective as well as long-lasting at outdoor operation.

V. METHODOLOGY

a) Hardware

1. To propose overall architecture for irrigation.
2. To design printed Circuit Board (PCB) Layout for irrigation.
3. Hardware implementation of Microcontroller (ATMega328P), Wi-Fi module (ESP8266) on PCB.

b) Software

1. To develop a C++ code for SPI communication between sensor node and Microcontroller in arduino IDE.
2. Log the sensor data onto Thing Speak (Open source data platform and API for the Internet of Things). Continuous monitoring of real time data.

VI. CONCLUSION

Lot of structure been developed employing wireless sensor in monitoring and predicting the soil condition for irrigation the area. In addition machine learning techniques been employed

towards yield supply and crop disease prediction only. Now with the advent of Machine to Machine Communication (M2M) which involves devices to communicate among themselves in taking action, we here have developed an intelligent IOT based Automated Irrigation system. By the system, the farmer will get more advantages in their production and they will get less difficulty while performing this structure, with the help this system they will get much closer to the advance farming.

VII. FUTURE SCOPE

1. IOT will derive the future technology, with various innovation and creative product.

2. The IOT can be used different section, the IOT based smart home will save power consumption up to 10%.

3. Following subscription show three example of the IOT trend will matter;
   a) Low power sensing unit.
   b) High efficiency in connectivity.
   c) Reliable communication.

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"HootFor – A Social Networking Application For Microblogging" submitted to International Journal for Science and Advance Research In Technology

Prof. Syed Rehan, Zainab Firdos ,Bushra Khan, Zobiya Anwar, Anam Sheikh

Computer Science and Engineering, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

The social networking application is an online community designed to make your social life more active and stimulating. The social network can help you maintain existing relationships with people and share pictures and messages, and establish new ones by reaching out to people you've never met before. Majority of students believe that social media is used by advertisers than the educators and companies for the promotion of their products, followed by its usage by educators, professionals and students. Most of the respondents are aware about innovative way of teaching and expect the same. All the respondents believe that there should be change in the existing education system and more innovative methods like social media should be used for education purposes. The use of social media for making presentations was found to be the first priority among students then getting and making the assignment updates. The currently developed Edu comp method of teaching is one of the most popular among the students though other method like home schooling was on top priority. "Hootfor" is a Social Networking Application providing its users to construct a public or semi-public profile within a system. Its basic concept is to post micro-blog and get support from friends and hootfor users. There are many forms of social media, including blogs, micro-blogs, wikis, photo sharing sites, instant messaging, video-sharing sites, podcasts, widgets, virtual worlds, and many more.

Keywords: Micro-Blogging, hoots, ranks, socio-economic profile, online networking platform, interaction, people communication.

I. INTRODUCTION

The social networking application is an online community designed to make your social life more active and stimulating. The social network can help you maintain existing relationships with people and share pictures and messages, and establish new ones by reaching out to people you've never met before. There are many forms of social media, including blogs, micro-blogs, wikis, photo-sharing sites, instant messaging, video-sharing's podcasts, widgets, virtual worlds, and many more. Since their introduction, social networks sites such as Myspace, Facebook, Cyworld and hi5 have attached millions of users, many of whom have integrated these sites into their daily practices. As of this writing there are hundreds of SNS, with various technological affordance, supporting a wide range of interest and

practices. While their key technological features are fairly consistent, the cultures that emerge around SNS are varied. Most sites support the maintenance of pre-existing social networks but others help strangers connect based on shared interest, political views or activities. Some sites cater to diverse audience, while others attract people based on common language or shared racial, religious or nationality based identities. Sites also vary in existent to which they incorporate new information and communication tool such as mobile connectivity, blogging, photos and videos sharing.

Social networking sites are not only for you to communicate or interact with other people globally but, this is also one effective way for business promotion. A lot of business minded people these days are now doing business online and use these social networking sites to response to customer queries. It isn't just a social media site used to socialize with your friends but also represent a huge pool of information from day to day living.

A social networking service is an online service, platforms or sites that focuses on facilitating the building of social networks and social relation among peoples who, for example, share interests, activities, background or real-life connections. A social network service consists of representation of each user, his/her social links, and a variety of additional services. Most social network services are web based. So to make it more user friendly we are creating an application that will serve all the feature of a social network website, including the facility to posts micro blogs and these blocks are ranked accordingly.

"Hootfor" is a Social Networking Application providing its users to construct a public or semi-public profile within a bounded system. Its basic concept is to post micro-blog and get support from friends and hootfor users. The users will register themselves to the application to share their views, thoughts, opinions through micro blogging and other registered users will either support or not support according to their views. User can hoot-up to support the hoot, by clicking Hoot-up button or hoot-down, if not agreed with the particular hoot, by clicking Hootdown button. If He /She can also opt for "Mum", if not completely agreed with the hoot.
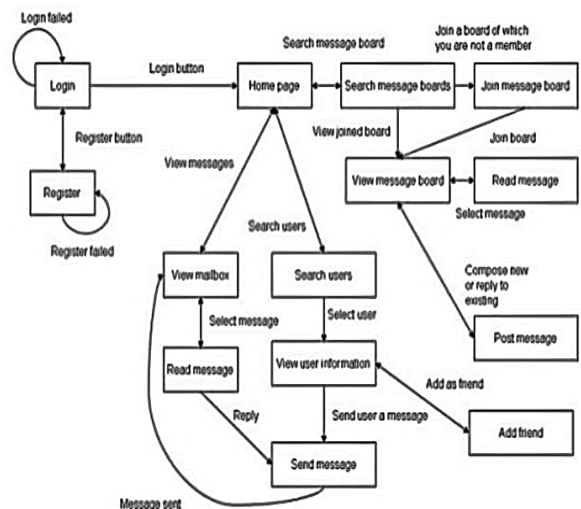
Figure 1. Flow of hoot for system

II. METHODS AND MATERIAL[Page Layout]

XAMPP SERVER:

XAMPP stands for Cross-Platform (X), Apache (A), MySQL (M), PHP (P) and Perl (P). It is a simple, lightweight Apache distribution that makes it extremely easy for developers to create a local web server for testing purposes. Everything you need to set up a web server – server application (Apache), database (MySQL), and scripting language (PHP) – is included in a simple extractable file. XAMPP is also cross-platform, which means it works equally well on Linux, Mac and Windows. Since most actual web server

deployments use the same components as XAMPP, it makes transitioning from a local test server to a live server is extremely easy as well.

Xampp uses the following components:

1. Apache: Apache is the actual web server application that processes and delivers web content to a computer. Apache is the most popular web server online, powering nearly 54% of all websites.

2. MySQL: Every web application, howsoever simple or complicated, requires a database for storing collected data. MySQL, which is open source, is the world's most popular database management system. It powers everything from hobbyist websites to professional platforms like WordPress. You can learn how to master PHP with this free MySQL database for beginnerscourse.

3. PHP: PHP stands for Hypertext Preprocessor. It is a server-side scripting language that powers some of the most popular websites in the world, including WordPress and Facebook. It is open source, relatively easy to learn, and works perfectly with MySQL, making it a popular choice for web developers.

4. Perl: Perl is a high-level, dynamic programming language used extensively in network programming, system admin, etc. Although less popular for web development purposes, Perl has a lot of niche applications.

JSON: JSON is a programming language. It stand for JavaScript Object Notation. It is textual, minimal and a subset of JavaScript. It is an independent data and exchange format and it is an alternative to XML.

Android provide support to parse the json object and array. Android provide four different classes to manipulate Json data. There classes are JSONArray, JSONObject, JSONStringer and JSONTokenizer.

VOLLEY:It is a library that makes networking for android apps easier and most importantly, faster. It manages the processing and caching of network requests and it saves developers valuable time from writing the same network call/cache code again and again.

Android connect to php and mysql:
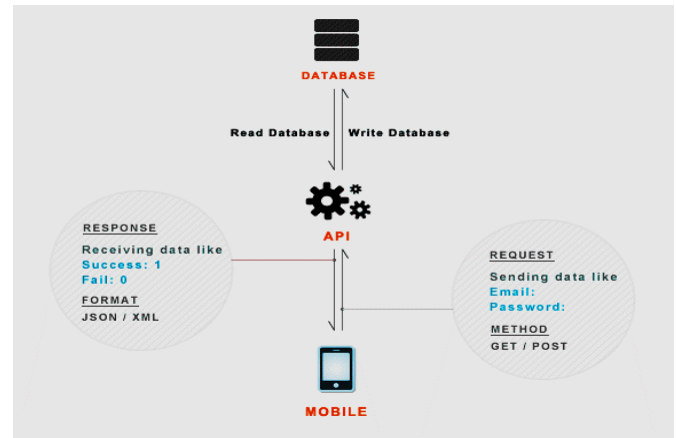
Figure 2. Android connect to php and mysql

To interact with MySQL database we need to build a REST API first. REST Api job is to get the request from client, interact with database and finally give the response back to client. So we'll create a simple PHP, MySQLAPI first. Our API do's below jobs.

- Accepts requests in GET/POST methods
- Interact with database by inserting / fetching data.
- Finally will give response back in JSON format

III. RESULTS AND DISCUSSION [Page Style]

While developing the system a conscious effort has been made to create and develop a software package, making use of available tools, techniques and resources – that would generate a proper system for online social networking. While making the system, an eye has been kept on making it as user-friendly. As such one may hope that the system will be acceptable to any user and will adequately meet his/her needs. As in case of any system development process where there are a number of short comings, there have been some shortcomings in the development of this system also. The proposed system will need three steps from every user. These steps are opening the application, filling the necessary credentials that is the user's email id and the password and then the user is directed to the home page of the website and is free to take full advantage of the facility. The challenge was not only to provide the news feed to the users but also to calculate the response of the user towards the post. The user can even do micro blogging and make new friends and can-do chatting with them.

IV. CONCLUSION

The rapid growth of mobile technology has generated a large number of mobile social networks in the last few years. There are a lot of advantages of having a mobile social network over having only web-based social networks. The value that the context awareness adds to the mobile social networks is very important. This also a big improvement in the services that the users can get, and also there is a good niche of business in the mobile advertisement.

However, there are some important factors to take into account as the privacy and security of the users'

information and the correctness in the use of mobile social networks. If we compare the mobile social networks that where analysed in this paper, they all have different characteristics, ones need to have a software installed and this one provides more interaction with the context of the user but other are WWW social networks, that can be used in most of the actual cell phones. Who's That for example, needs to have software installed in the cell phone but the profile of the user can be retrieved from any social network. That is a great feature, because there is no need to have two profiles one for the desktop and one for the mobile environment. Mobile Facebook works also like that, but it does not have the ability to find users nearby as Who's that has. Hootfor is a light weight mobile social network that does not need any software, and it work only with SMS, but it does not use any of the cell phone context information. Hootfor needs software installed and only works with in network.

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A Comparative Analysis of the Voltage Profile Stability for the Wind Farm Using Capacitor Bank and STATCOM

Chandan S. Kamble[1], Dipesh Suryawanshi[2], Rajni Rewatkar[1]

[1]Assistant Professor, Priyadarshini College of Engineering, Nagpur, Maharashtra, India

[2]Assistant Professor, Prestige College of Engineering, Nagpur, Maharashtra, India

ABSTRACT

The performance of the STATCOM reactive power control system is powerful and robust can open the opportunities in the field of renewable energy system to make them more reliable and efficient. Wind generation is currently the major form of new renewable, generation in the world. The active power mainly depends upon the potential of the wind power produced and wind turbine generator design whereas the reactive power demand on the other hand depends upon conversion devices and recovered power quality fed to the grid. The wind farms which accesses to power grid cause fluctuations and reactive power redistribution and sometimes lead to voltage collapse. Similarly, the dynamic voltage stability is a major challenge faced by distribution network operators. The proposed scheme contains modeling of wind turbine DFIG and STATCOM for development of sophisticated control system. Because of uncertainty of wind and environmental condition, monitoring of the voltage profile is done easily.Modeling of wind turbine (DFIG) generation with the control circuitry as to get synchronised with the STATCOM and Capacitor Bank demonstrated using MATLAB/Simulink environment.

Keywords: STATCOM, DFIG, Capacitor ,wind energy

I. INTRODUCTION

Figure 1.1 presents a topology that consists of a DFIG with AC/DC and DC/AC converters, as a four-quadrant AC/AC converter using isolated gate bipolar transistors (IGBTs) connected to the rotor windings. In the DFIG topology, the induction generator is not a squirrel cage machine and the rotor windings are not short circuited. Instead, the rotor windings are used as the secondary terminals of the generator to provide the capability of controlling the machine power, torque, speed, and reactive power.
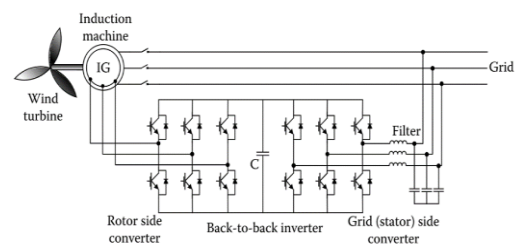
Figure 1. DFIG (Doubly Fed Induction Generator) Topology

To control the active and reactive power flow of the DFIG topology, the rotor side converter (RSC) and GSC should be controlled separately [1-4]. Wound rotor induction machines can be supplied

from both the rotor and stator sides. The speed and the torque of the wound rotor induction machine can be controlled by regulating voltages from both the rotor and the stator sides of the machine.

II. MATHEMATICAL MODELLING

In order to achieve the usual modelling of induction machine some of the following assumption has been made.

- Effect of slots on machine performance is ignored.

- The rotor has symmetrical structure. This enables the identical d-q circuits.

- Rotor speed is not fixed and can be varied according to load and the requirement. This may affect the selection d-q reference frame.

- There is no excitation source applied in the rotor winding. Slip is main variable to determine the dynamic of the rotor circuit.

- Rotor is modelled as equivalent three phase winding as it provides the same rotating mmf with respect to the stator only.

- Also, core loss is neglected; assumption is made only for available copper loss.

To minimize the complexity stator variable and parameter are given by K_{abc} and rotor parameter and variables are defined using K_{ABC}.
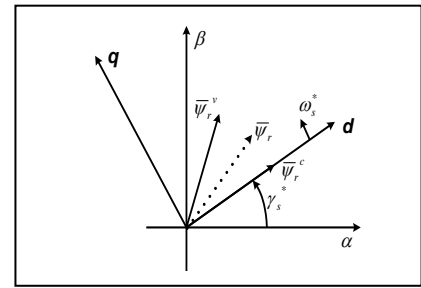
Figure 2. Position of rotor flux vector $\bar{\psi}_r$ in stationary reference frame α - β, and synchronously rotating reference frame d-q.

$$v_a = V_m \sin\left(\omega_s t\right)$$

$$v_b = V_m \sin\left(\omega_s t - \frac{2\pi}{3}\right)$$

$$v_c = V_m \sin\left(\omega_s t + \frac{2\pi}{3}\right)$$

$$(2.1)$$

$$i_a = I_m \sin\left(\omega_s t\right)$$

$$i_b = I_m \sin\left(\omega_s t - \frac{2\pi}{3}\right)$$

$$i_c = I_m \sin\left(\omega_s t + \frac{2\pi}{3}\right)$$

$$(2.2)$$

Rotor axis is shifted by angle θ i.e. rotor axis leads the axis of phase a stator winding.

$$\theta = \omega_r t$$

$$\omega_r = \left(1 - s\right)\omega_s$$

$$(2.3)$$

As defined earlier that the ω_r is rotor angular velocity in rad/s and ω_s is angular velocity of stator field in rad/s.

Dynamic equations of induction machine are given as;

$$v_a = r_a i_a + p\psi_a$$

$$v_b = r_b i_b + p\psi_b$$

$$v_c = r_c i_c + p\psi_c$$

$$(2.4)$$

In the equation 3.7 the stator dynamics and rotor dynamic equation are given.

$$v_A = r_A i_A + p\psi_A$$
$$v_B = r_B i_B + p\psi_B \qquad (2.5)$$
$$v_C = r_C i_C + p\psi_C$$

In equation 2.4 and 2.5 both ; ψ represents the flux linkage in the respective winding, r_{ABC} is the rotor resistance in respective phases. Where, the r_{abc} is the stator resistance of respective phases.

Here the mutual inductance between the stator and rotor are function of rotor position given in the system. Flux linkage for every stator phase is given, in these the self-inductance (L_{ss}) is given with the mutual (L_{sr}) inductance

III. STATIC SYNCHRONOUS COMPENSATOR (STATCOM)

Figure 3.1 shows the basic model of a STATCOM which is connected to the ac system bus through a coupling transformer. In a STATCOM, the maximum compensating current is independent of system voltage, so it operates at full capacity even at low voltages. A STATCOM's advantages include flexible voltage control for power quality improvement, fast response, and applicability for use with high fluctuating loads. The shunt inverter, transformer and connection filter are the major components of a STATCOM. The control system employed in this system maintains the magnitude of the bus voltage constant by controlling the magnitude and/or phase shift of the voltage source converter's output voltage. By properly controlling iq, reactive power exchange is achieved. The DC capacitor voltage is maintained at a constant value and this voltage error is used to determine the reference for the active power to be exchanged by the inverter. The STATCOM is a static *VAr* generator whose output can be varied so as to

maintain or control certain specific parameters of the electric power system.
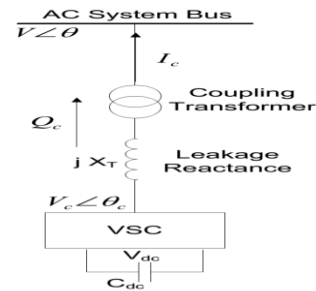
Figure 3. STATCOM Model

The STATCOM is a power electronic component that can be applied to the dynamic control of the reactive power and the grid voltage. The reactive output power of the compensator is varied to control the voltage at given transmission network terminals, thus maintaining the desired power flows during possible system disturbances and

contingencies.

IV. IMULATION AND RESULTS

Simulation Model:-

Given in figure 4.1 where the wind farm is depicted in the separate unit as shown in figure 4.2. The STATCOM based system has the different advantages as mentioned earlier. As no trip system has been incorporated in the unit to show the error free and no fault condition. However, one can create fault at any of the wind turbine to monitor the effect of the undervoltage, overspeeding, overvoltage and overcurrent.

The system has been modelled and simulated using the SIMULINK/MATLAB 2013a and has been verified for different level of condition.

Two conditions have been modelled as faulted case where one of the wind turbine experience a three-

phase bolted fault for momentary condition. Another case where the system behaves in healthy condition.
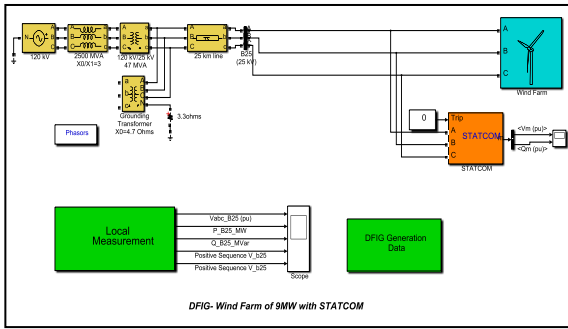
Figure 4. Simulation of Wind Turbine Setup with STATCOM

Simulation result:-
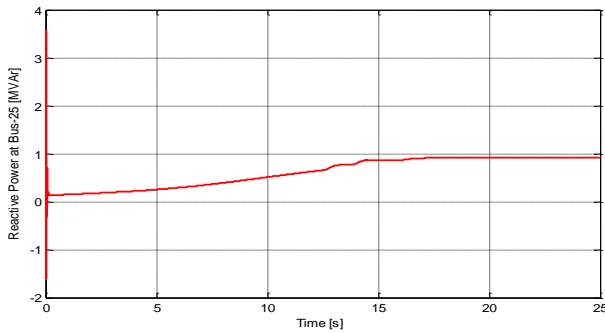
Figure 5. Reactive Power Injected at B25 During Healthy Condition
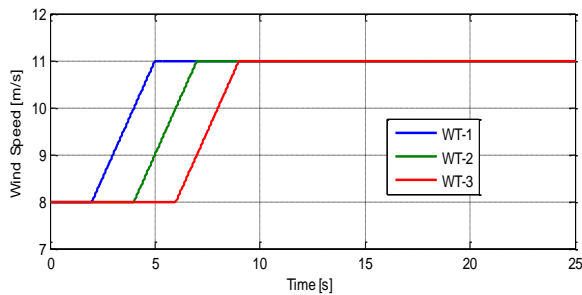
Figure 6. Wind Speed Obtained at Different Wind Turbine

Figure above shows the wind speeds at the different location of the farm as encountered by the different wind turbine.
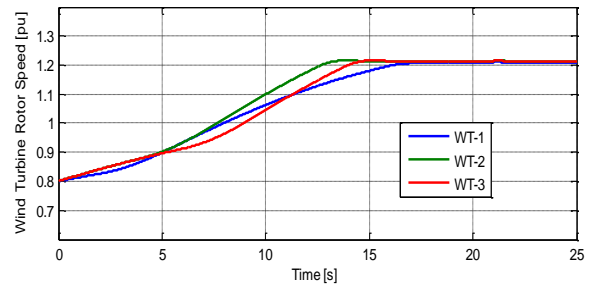
Figure 7. Wind Speed in [pu] as Encountered by the Respective WT.

In the system with installation in the same area the distance somehow may not be nearer to each other. The per unit rotor speed to the wind turbine and DFIG is given in the figure 4.9for the reference of the activation. As soon as speed hits the value near to 1.1 [pu] DFIG get starts the generation.
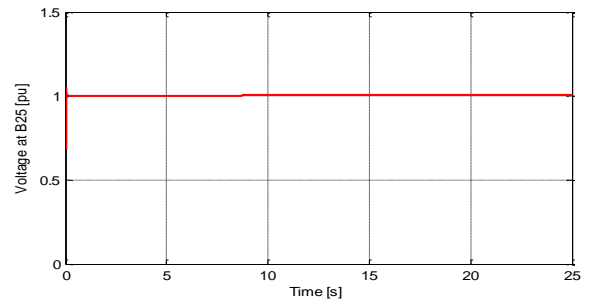
Figure 8. Bus Voltage at Sub-transmission level (B25) at Healthy Condition
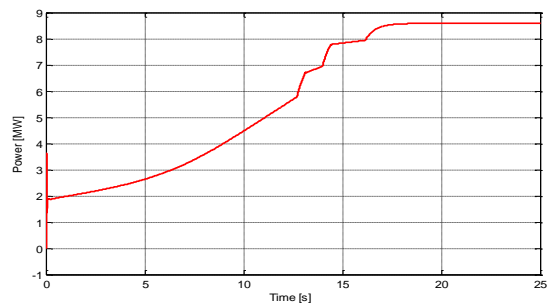
Figure 9. Active Power injected at the BUS-25
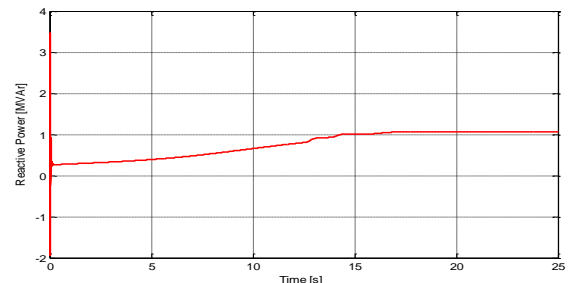
Figure 10. Reactive Power Injected at the BUS-25

It is found that, the active and reactive power injected at B25 when STATCOM is connected to the system. It is evident that the reactive power support is increased in the second case as compared to the reactive power injected during the capacitor bank is connected in the network. The major advantage of the STATCOM connected network is proved
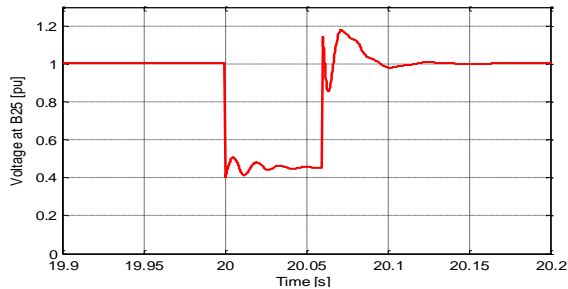
Figure 11. Voltage at Bus-25 with Bolted (3-Phase)Fault
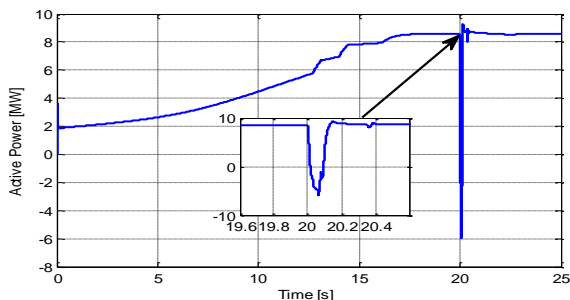
Figure 12. Active Power Injected in the B25 during Fault

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Static Signature Verification and Recognition Through Artificial Neural Network

Prof. M. S. Khatib[1], Prof. Saima Ansari[1], Aliya Pathan[2], Eileen Kerketta[2]

[1]Department of Computer Sci. & Engg. Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, Maharashtra, India

[2]Department of Computer Science and Engineering,Anjuman College of Engineering and Technology, Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

For person identification, signature has always been a discriminating feature. Currently, due to advancement there is an increase of authorization via signatures for transaction, especially in the field of finance and business. Therefore, automatic signature verification and recognition should be developed if authenticity is verified and guaranteed successfully on regular terms. Nowadays, huge number of documents, for example: bank cheques, have to be authenticated in limited time but often the signature is unrealistic of the account's holder in terms of manual verification. Authentication and authorization are the secure means that are provided by signatures. Hence, there is the need of identification systems and automatic signature verification. At the present time, people prefer drawing a shape as their signature instead of hand written signatures, as these are different from other textual type, since it does not have text in it. So, an unusual approach should be kept in account to process such signatures. The present research work is on Static signature recognition system signature verification and recognition have been signature recognition system.

Keywords: Authorization, Transaction, Authentication, Automatic, Extraction.

I. INTRODUCTION

The objective of the signature verification and recognition system is to make out characteristics or extract the key feature of a personal style of handwriting. A sign of a person is a special case of handwriting uses special characters. Many signature can be unreadable. A signature can be handled as a pattern and it can be recognized using Artificial Neural Network technique.

A)Feature of signature verification:
There are two types of features:

i. Global Features
ii. Local Features

B) Types of signature verification:
i. Online i.e. Dynamic Signature Verification Technique
ii. Offline i.e. Static Signature Verification Technique

C) Types of Counterfeit of signature:
i. Random Forgery
ii. Simple Forgery
iii. Skilled Forgery

II. LITERATURE REVIEW

Shashi Kumar , R. K Chhotaray, D R K B Raja and Sabyasachi Pattanaik [1] introduced Off-line Signature Verification which was Based on Fusion of Grid and Global Features Using Neural Networks. The Fusion of global and grid features were used to generate dominant feature set and neural networks are used as classifier.

The algorithm and flowchart offers the offline signature verification system to confirm the genuineness of signature in which Artificial Neural Network is used [2].

Abikoye, O. C., M. A. Mabayoje, and R. Ajibade[3] proposed a scheme for signature verification and recognition for Artificial Neural network. They have given more specification which would carry far more in signature verification. They were given one of these modelled of verification and them also, and extracted the procedure of their work. They consider a small database and took few peoples signature and forged signature as well. The main aim of this paper was the utility of signature verification helps in detecting the exact person and more accuracy in verifying signatures for implementation.

Paigwar Shikha and Shukla Shailja[4] highlighted their method for Multilayer perception, modular neural network and the collaboration with feed-forward networks and Self Organizing Map group's neural network comparison for absolute study process. Over here they found that multilayer perception was better for having multilayer networks because it is more reliable to solve complicated problems rather than single layer perceptions. They used small database as a pilot project basis and do not consider the big database

and to evaluate robustness and signature verification problems. They reduced the False Rates Rejection, (FRR), False Acceptance Rate (FAR) and Total error rate (TER).

Radmehr, Anisheh, Nikpour and Yaseri [5] developed an offline signature recognition system based on Radon transform, fractal dimension (FD) and SVMs. Experimental result of the proposed method achieved true positive rate (TPR) consisting of 92.5% and false positive rate (FPR) resulted in 10% using polynomial kernel for 5 classes in their proposed method. For comparison, they evaluated the performance using a linear kernel and a radial basis function kernel as well. The scope of our work in contrast covered up to 30 classes with improved accuracies in classification employing multilayer ANN and SVM RBF kernel.

This projected offline signature verification system offers computerized method of verification and recognition by extracting features that characterizes each input signature [6].

III. METHODOLOGY

The approach starts by scanning images into the computer using peripheral devices, then modifying their quality through image enhancement, followed by feature extraction and neural network training, and finally verifies whether a signature is genuine or counterfeit.
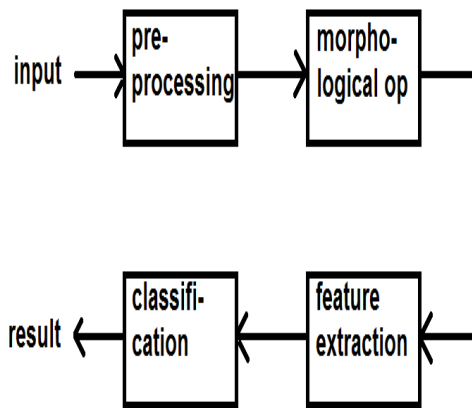
Figure 1. Basic diagram of Static signature verification

A] Pre- processing

Generally in any image processing application preprocessing is required to remove alteration, from the original input image. Any normal scanner with sufficient resolution can be used as an image attainment device for offline operation. Signatures are scanned in gray, using following equation as,

Gray colour = (0.299*Red) + (0.5876*Green) + (0.114*Blue)

The purpose in this stage is to build standard signatures and prepare them for features extraction.

1)Scaling:

Let H be the height of the inputted image & W be the width of the inputted image. We can fit the image uniform at 100*100 pixels by using the following equation as

Xnew = (Xold * 100)/H;

Where Xnew & Xold are calculated & original X coordinate

Ynew = (Ynew * 100)/W;

Where Ynew & Yold are calculated & original Y coordinate.

2)Noise Reduction:

Images are contaminated due to stemming from decoding errors or noisy channels. An image also gets degraded because of the detrimental effects due to illumination and other objects in the environment. Median filter is extensively used for smoothing and restoring images corrupted by noise.

3) Background elimination:

We used thresholding method for distinguishing the signatures from the background. In this, we are focussing in the dark objects on light background and hence threshold value T entitled as a brightest threshold is chosen and applied to the image.

4) Signature Normalization:

Image consists of irregular dimensions which causes fluctuation. Throughout this process the characteristic ratio between the width and height of a signature is kept undamaged.

5) Thinning:

The goal of thinning is to eliminate the thickness differences of pen by making the image one pixel thick. Thinning was introduced to describe the global properties of objects and to reduce the original image into a more compact representation [6].

B) Feature extraction

In Feature extraction, the essential features are extorted from the original input signature. The features to be extorted are based on the application and fluctuate accordingly [6].

1)Global Features:

Global feature offers information regarding shape like signature area, signature height-to-width ratio, slope & slope direction skewness of signature etc.

2)Mask Features:

This provides information about guidelines of the lines of the signature for the reason that the angles of signature have interpersonal variation.

3)Texture Features:

The texture features are the pixel positions with respect to the property of the feature. These can be processed using a matcher which uses co-occurrence matrix of the picture image. It includes End points, Branch points, crossing points. To extract these features, it is necessary to apply the pre-processing techniques like Thresholding and thinning on a gray scale signature image [6].

IV. CONCLUSION

The main features that attributed to ANN is it's ability to learn non-linear problem offline with training selectively which can lead to sufficiently accurate response.

Application of ANN has attained importance due to efficient work in the present day computers. The verification system based on ANN is the ability to learn different kinds of signature datasets by using only geometrical offline features. The classification ratio exceeds 93% though the parameter of threshold deciding the genuineness of an image is 90%. The accuracy in this problem cannot be guaranteed since we are not imitating the signatures to the extent of being considered as being forgeries.

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Implementation and Simulation of 4g Co-Operative Relay Network

Ashwini Hatkar, Saurabh Sawarkar, Akash Tondre
Department of Electronics Engineering, Karmaveer Dadasaheb Kannamvar College Of Engineering, Nagpur,
Maharashtra, India

ABSTRACT

The Co-operative Communication (CC) is a technology that allows multiple nodes to simultaneously transmit the same data. It can save power and extend transmission coverage. However, prior research work on topology control considers CC only in the aspect of energy saving, not that of coverage extension. Recently, there has been increasing interest in integrating multi-hop relaying functionalities into MANET. Multi-hop wireless networks can potentially enhance coverage, data rates. Throughput and packet delivery ratio are used as performance metrics for contrast. We are comparing the performance when the size of the packet changes, when the time interval between the packets are changed, when mobility of nodes changes. Wireless network are consider that is WiMAX (Worldwide Interoperability for Microwave Access) which is a wireless communication standards based on the IEEE 802.16, it provides multiple physical layer (PHY) and media access control (MAC) options. Till now wi-fi network is used but it operates in the range of 20 meters with the speed 50 Mbps whereas, WiMAX operates upto 50 kilometers with the speed of 70 Mbps. The protocol NS2.3.1 is used and TCL (tool command language) used to generates two files network animator (.nam) and trace file (.tr). Network animator based on animation tool for viewing network simulation traces and real world packet traces, and trace file log every packet, every event that occurred in the simulation and are used for analysis.

Keywords: Wimax Technology, NS-2, 4G-Technology, Manet, Relay Network

I. INTRODUCTION

The approaching 4G (fourth generation) mobile communication systems are projected to solve still-remaining problems of 3G (third generation) systems and to provide a wide variety of new services, from high-quality voice to high-definition video to high-data-rate wireless channels.The term 4G is used broadly to include several types of broadband wireless access communication systems, not only cellular telephone stems. One of the terms used to describe 4G is MAGIC-Mobile multimedia, anytime anywhere, Global mobility support, integrated wireless solution, and customized personal service. As a promise for the future, 4G systems, that is, cellular broadband wireless access systems ,have been attracting much interest in the mobile communication arena. The 4G systems not only will support the next generation of mobile service, but also will support the fixed

wireless networks. This paper presents an overall vision of the 4G features, framework, and integration of mobile communication. The features of 4G systems might be summarized with one word Integration. The 4G systems are about seamlessly integrating terminals, networks, and applications to satisfy increasing user demands. The continuous expansion of mobile communication and wireless networks shows evidence of exceptional growth in the areas of mobile subscriber, wireless network access, mobile services, and applications. An estimate of 1 billion users by the end of 2003 justifies the study and research for 4G systems.

II. PROBLEM IDENTIFICATION

Losses are more in 2G and 3G: In 3G, network based QoS depends on following factor to provide a satisfactorily service as: Throughput, Packet Loss Rate, reliability and delay. Where as in 4G With respect to network quality, many telecommunications providers are promising that there will be enhanced connectivity, and the quality of data that is transmitted across the network will be of the highest possible quality. The main challenge that 4G networks are facing is integrating non-IP based and IP based devices. It is known that devices that are not IP address based are generally used for services such as VoIP. On the other hand, devices that are IP address base are used for data delivery.4G networks will serve both types of devices.

Speed is low in 2G and 3G: 4G speeds are meant to exceed that of 3G. Current 3G speeds are topped out at 14Mbps downlink and 5.8Mbps uplink. To be able to qualify as a 4G technology, speeds of up to 100Mbps must be reached for a moving user and

1Gbps for a stationary user. So far, these speeds are only reachable with wired LANs. The 4G is faster, it is said to be four times faster than its predecessor. This allows for a connection speed more comparable to DSL and home cable networks. It is great news for those completing work and accomplishing important tasks away from their home and office. When uploading large documents and communicating via the internet, a fast connection is important. Whereas 3g doesn't favor such speed as compare to that of 4G.

Low data rate: When the 3G was introduced, cell phone users were finally able to talk and access data at the same time and with higher data rates. This allowed for a better full service for cell phone users wishing to access the internet. And what is even greater is the 4G data rates are expected to be even higher. Users will have the capability of accessing more data at higher speeds while talking on their cell phone. In addition, the fourth generation permits more data transmission of such services as games and multimedia. It also allows a larger amount of internet support.

Guaranteed delivery of data is not possible: Another key change in 4G is the abandonment of circuit switching. 3G technologies use a hybrid of circuit switching and packet switching. Packet switching is a technology that is very prevalent in computer networks but has since appeared in mobile phones as well. With packet switching, resources are only used when there is information to be sent across. The efficiency of packet switching allows the mobile phone company to squeeze more conversations into the same bandwidth. 4G technologies would no longer utilize circuit switching even for voice calls and video calls. All information that is passed around would be packet switched to enhance efficiency.

III. AIM AND OBJECTIVES

To overcome the congestion problem the objective is that to design a such type of wireless network which will be scalable which will have the best optimum performance at any condition. It should increase the efficiency of data transmission rate so that maximum no of transmission will take place and throughput of the network should be achieved at a higher performance.

The aim is to reduce the packet data loss if the packet data loss will be reduces transmission will not taken place and power will save as the packet data loss is decreases, definitely congestion will minimize.

In the proposal algorithm, multiple source destination player sending receiving data at the same time are taken. In these the buffer availability of nodes is checked to detect the consumption in the path. If the buffer value is less than a threshold, packets through that rout are send continuously but if it exist a certain threshold then second condition it checked i.e. checking the no of packet present in a buffer for in destination respectively, if it increase a certain threshold then an alternate path for that particular source destination pair is chosen otherwise the packet will be forwarded through that route.In these way, proposed technique resole the congestion problem and reduce the delay and increase the throughput their by increasing the network performance on the whole.

IV. METHODOLOGY

Network creation using NS2:-Simple Wireless Program in NS2 is the best way to learn about how to code in NS2. NS2 is one of the best simulation tool used by majority of scholars today due to its highlighted features like support for OOPs concept, C++ programming fundamentals, real time emulation support etc. NS2 is used to simulate both wired and wireless networks; here we have focused on wireless network simulation in NS2 due to its wide applicability. Regarding wired simulation in NS2, refer our other articles available in this site.

Protocol implementation:- In the aspect of simulation, the primary component in designing a mobile adhoc network is mobility model while the other components include node configuration, random topology, and communication model. In mobility model, the mobility of a node from a location to another location can be enabled using the keyword "setdest" in Tool Command Language (TCL) script. The specifications for a node's target location include x-coordinate, y-coordinate along with the speed. Nodes are configured with the components of channel, networking interface, radio propagation model, Medium Access Control (MAC) protocol, adhoc routing protocol, interface queue, link layer, topography object, and antenna type. In dynamic topology, the neighbors of each node vary with the location of that particular node. Nodes in adhoc network communicate using communication model. The sample14.tcl illustrates the design of mobile adhoc network that consists of 3 mobile nodes. The movements of mobile nodes are confined to an area of 500mX500m with the pause time of 3s. Data transmission is established between nodes using UDP agent and CBR traffic. These intermediate routers forward the packets generated by other nodes to their destination.

MIMO implementation:- MIMO uses signal multiplexing between multiple transmitting antennas (space multiplex) and time or frequency. It is well suited to OFDM, as it is possible to process independent time symbols as soon as the OFDM

waveform is correctly designed for the channel. This aspect of OFDM greatly simplifies processing. The signal transmitted by m antennas is received by n antennas. Processing of the received signals may deliver several performance improvements range, quality of received signal and spectrum efficiency. In principle, MIMO is more efficient when many multiple path signals are received. The performance in cellular deployments is still subject to research and simulations. However, it is generally admitted that the gain in spectrum efficiency is directly related to the minimum number of antennas in the link.

OFDM technology:- Orthogonal Frequency Division Multiplexing (OFDM) not only provides clear advantages for physical layer performance, but also a framework for improving layer 2 performance by proposing an additional degree of free- dom. Using OFDM, it is possible to exploit the time domain, the space domain, the frequency domain and even the code domain to optimize radio channel usage. It ensures very robust transmission in multi-path environments with reduced receiver complexity. OFDM also provides a frequency diversity gain, improving the physical layer performance .It is also compatible with other enhancement Technologies, such as smart antennas and MIMO (multiple-input and multiple-output)radar antenna .OFDM modulation can also be employed as a multiple access technology (Orthogonal Frequency Division Multiple Access). In this case, each OFDM symbol can transmit information to/from several users using a different set of sub carriers (sub channels). This not only provides additional flexibility for resource allocation (increasing the capacity), but also

enables cross-layer optimization of radio link usage.

V. TECHNOLOGY
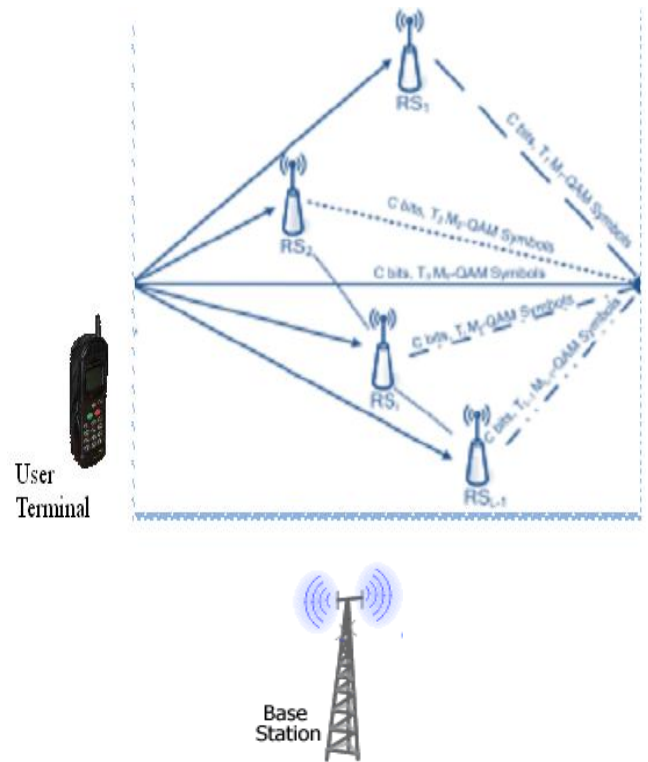
Figure 1. Block diagram of proposed system

MIMO (Multiple I/P Multiple O/P): In radio, multiple-input and multiple-output, or MIMO is a method for multiplying the capacity of a radio link using multiple transmit and receive antennas to exploit multipath propagation. MIMO has become an essential element of wireless communication standards including IEEE 802.11n (Wi-Fi), IEEE 802.11ac (Wi-Fi), HSPA+ (3G), WiMAX (4G), and Long Term Evolution (4G). More recently, MIMO has been applied to power-line communication for 3-wire installations as part of ITU G.hn standard and Home Plug AV2 specification .At one time, in wireless the term "MIMO" referred to the use of multiple antennas at the transmitter and the receiver. In modern usage, "MIMO" specifically refers to a practical technique for sending and

receiving more than one data signal simultaneously over the same radio channel by exploiting multipath propagation. MIMO is fundamentally different from smart antenna techniques developed to enhance the performance of a single data signal, such as beam forming and diversity.
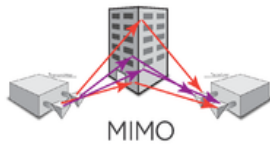
Figure 2. MIMO Technology

AMC (Adaptive Modulation & Coding): Adaptive Modulation and Coding (AMC) in LTE networks is commonly employed to improve system throughput by ensuring more reliable transmissions. Most of existing AMC methods select the modulation and coding scheme (MCS) using pre-computed mappings between MCS indexes and channel quality indicator (CQI) feedbacks that are periodically sent by the receivers. However, the effectiveness of this approach heavily depends on the assumed channel model. In addition CQI feedback delays may cause throughput losses. In this paper we design a new AMC scheme that exploits a reinforcement learning algorithm to adjust at run-time the MCS selection rules based on the knowledge of the effect of previous AMC decisions. The salient features of our proposed solution are: i) the low-dimensional space that the learner has to explore, and ii) the use of direct link throughput measurements to guide the decision process. Simulation results obtained using ns3 demonstrate the robustness of our AMC scheme that is capable of discovering the best MCS even if the CQI feedback provides a poor prediction of the channel performance.

OFDM (Orthogonal Frequency Division Multiplexing): Orthogonal frequency-division multiplexing (OFDM) is a method of encoding digital data on multiple carrier frequencies. OFDM has developed into a popular scheme for wideband digital communication, used in applications such as digital television and audio broadcasting, DSL Internet access, wireless networks, power line networks, and 4G mobile communications. COFDM stands for Coded orthogonal frequency-division multiplexing. It differs from OFDM because in COFDM, forward error correction is applied to the signal before transmission. This is done to overcome errors. COFDM and OFDM are sometimes used as synonyms. OFDM is a frequency-division multiplexing (FDM) scheme used as a digital multi-carrier modulation method. A large number of closely spaced orthogonal sub-carrier signals are used to carry data[2] on several parallel data streams or channels. Each sub-carrier is modulated with a conventional modulation scheme (such as quadrature amplitude modulation or phase-shift keying) at a low symbol rate, maintaining total data rates similar to conventional *single-carrier* modulation schemes in the same bandwidth. The primary advantage of OFDM over single-carrier schemes is its ability to cope with severe channel conditions (for example, attenuation of high frequencies in a long copper wire, narrowband interference and frequency-selective fading due to multipath) without complex equalization filters. Channel equalization is simplified because OFDM may be viewed as using many slowly modulated narrowband signals rather than one rapidly modulated wideband signal. The low symbol rate makes the use of a guard interval between symbols affordable, making it possible to eliminate inter symbol interference (ISI) and utilize echoes and time-spreading (on analogue TV these are visible as ghosting and blurring, respectively) to

achieve a diversity gain, i.e. a signal-to-noise ratio improvement. This mechanism also facilitates the design of single frequency networks (SFNs), where several adjacent transmitters send the same signal simultaneously at the same frequency, as the signals from multiple distant transmitters may be combined constructively, rather than interfering as would typically occur in a traditional single-carrier system.

VI. TOOLS

NS 2.31

All of them are discrete-event computer network simulators, primarily used in research and teaching. ns-3 is free software, publicly available under the GNU GPLv2 license for research, development, and use. The goal of the ns-3 project is to create an open simulation environment for computer networking research that will be preferred inside the research community:

- It should be aligned with the simulation needs of modern networking research.
- It should encourage community contribution, peer review, and validation of the software.

Since the process of creation of a network simulator that contains a sufficient number of high-quality validated, tested and maintained models requires a lot of work, ns-3 project spreads this workload over a large community of users and developers.

History:-In 2006, a team led by Tom Henderson, George Riley, Sally Floyd, and Sumit Roy, applied for and received funding from the U.S. National Science Foundation (NSF) to build a replacement for ns-2, called ns-3. This team collaborated with the project of INRIA at Sophia Antipolis, with

Mathieu Lacage as the software lead, and formed a new open source project. In the process of developing ns-3, it was decided to completely abandon backward-compatibility with ns-2. The new simulator would be written from scratch, using the C++ programming language. Development of ns-3 began in July 2006.The first release, ns-3.1 was made in June 2008, and afterwards the project continued making quarterly software releases, and more recently has moved to three releases per year. NS-3 made its twenty first released (ns-3.21) in September 2014.Current status of the three versions is:

- ns-1 development stopped around 2001. It is no longer developed nor maintained.
- ns-2 development stopped around 2010. It is no longer developed, and the last maintenance release was in 2013.
- ns-3 is still developed (but not compatible for work done on ns-2)

Design:-Ns-3 is built using C++ and Python with scripting capability. The ns-3 library is wrapped by Python thanks to the pybindgen library which delegates the parsing of the ns-3 C++ headers to gccxml and pygccxml to automatically generate the corresponding C++ binding glue. These automatically-generated C++ files are finally compiled into the ns-3 Python module to allow users to interact with the C++ ns-3 models and core through Python scripts. The ns-3 simulator features an integrated attribute-based system to manage default and per-instance values for simulation parameters.

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Project Report on Bus Tracker Via Gps Using Android Application

Jitendra Patra[1], Kaushik Babhure[1], Mohammad Altamash[1], Shivam Asode[1], Swapnil Mahalle[1], Prof. Nusrat Anjum[2]

[1]Department of Computer Science & Engineering, Nagpur, Maharashtra, India
[2]CSE Department of Computer Science & Engg, Nagpur, Maharashtra, India

ABSTRACT

Android is becoming very popular in embedded market for two main reasons. First, it is open source software; moreover, there are no royalty fees for java VM (virtual machine). Second deriving from the first, android is highly suitable for expansion as the developer sees fit. Being Computer Science Engineering Users ourselves, we have been motivated to develop this project for the benefit of the people masses, by the idea of providing an easier means of accessing various web resources related to the bus, thus providing them with a better, richer experience of travelling. Further, the recent advent and popularity of android technology motivates us to create an android application for the same. Our project is an application for smart phones that supports android operating system. It uses the GPS function, available in most of smart phones today, to pin point current location fairly accurate. The whole project is revolving around the tracking of public transport (i.e. ST Buses).

In this project we having three modules i.e. Bus driver, customer & firebase database. As the name suggested Driver module is for the drivers. The driver will login through this module and after login it will insert the details of route. The whole details with the driver's location are stored in the firebase database. The location co ordinates will continuously storing in data base.

The next module is customer module, in this module the customer have to sign up and then login themselves. After login the user have to fill detail which is required for search the bus location, like sources address destination address. These details will used to search a current appropriate bus location. Here the role of third module plays important role. The whole database is manages here and serve for the use. The co ordinates of bus current location is continuously storing in database and serve it were its required.

I. INTRODUCTION

As we discuss above our project is based on Global Positioning System (GPS) & compose ofclient-server interface. At client side we have Android Application. At server side we are using Fire base database provided by Google for storing information. GPS system is use to track the real time location of the vehicle. In the early developed applications or in existing systems for vehicle tracking it consist of GPS and web server such as SQL for showing location on Google Maps. In our proposed system we are providing location to the user who requested for it or the user which has an account in our application. In our project we have used firebase because if there is no internet

connectivity is available the firebase stores the data locally and then stores it into the database.

II. TECHNOLOGIES USED

i.GPS Technology:

The Global Positioning System (GPS) is a satellite-based navigation system made up of at least 24 satellites. GPS works in any weather conditions, anywhere in the world, 24 hours a day, with no subscription fees or setup charges. The U.S. Department of Defense (USDOD) originally put the satellites into orbit for military use, but they were made available for civilian use in the 1980's.GPS satellites circle the Earth twice a Day in a precise orbit. Each satellite transmits a unique signal and orbital parameters that allow GPS devices to decode and compute the precise location of the satellite. GPS receivers use this information and trilateration to calculate a user's exact location. Essentially, the GPS receiver measures the distance to each satellite by the amount of time it takes to receive a transmitted signal. With distance measurements from a few more satellites, the receiver can determine a user's position and display it electronically to measure your running route.

ii. Fire Base:

Firebase is a mobile and web application development platform developed by Firebase, Inc. in 2011, and then acquired by Google in 2014. Firebase provides a real-time database and backend as a service. The service provides application developers an API that allows application data to be synchronized across clients and stored on Firebase's cloud. The company provides client libraries that enable integration with Android, iOS, JavaScript, Java, Objective-C, swift and Node.js applications. The database is also accessible through a REST API and bindings for several JavaScript frameworks such as Angular JS, React, Ember. Js and Backbone. Js is The REST API uses the Server-Sent Events

protocol, which is an API for creating HTTP connections for receiving push notifications from a server. Developers using the real-time database can secure their data by using the company's server-side-enforced security rules. Firebase Storage provides secure file uploads and downloads for Firebase apps, regardless of network quality. The developer can use it to store images, audio, video, or other user-generated content. Firebase Storage is backed by Google Cloud Storage.

iii. Google Maps:

Google Maps is a web mapping service developed by Google. It offer satellite imagery, street maps,360° panoramic views of streets (Street View), real-time traffic conditions (Google Traffic), and route planning for traveling by foot, car, bicycle (in beta), or public transportation. Google Maps provides arouse planner, allowing users to find available directions through driving, public transportation, walking, or biking. The Google Maps apps on Android and IOS have many features in common, including turn-by-turn navigation, street view, and public transit information. Updates in June 2012 and May 2014 enabled functionality to let users save certain map regions for offline access, while updates in 2017 have included features to actively help U.S. users find available parking spots in cities, and to give Indian users a two-wheeler transportation mode for improved traffic accessibility.

III. GRAPH
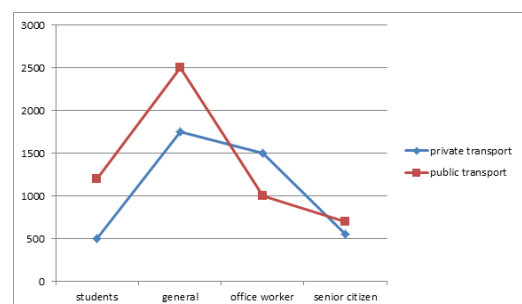
Figure 1. Graphical representation of Number of Users

IV. IMPLEMENTATION

The proposed system highlights on the GPS Location for Users about current position of state transport vehicle.Location-based Service is another key functionality that is used in Smartphone applications. It is often combined with maps to give a good experience to the user about their location.

A. Modules at Driver side

1. Bus Driver Login.
2. Fetching Bus Location.

1) **Bus Driver Login**: In this module, at front-end user enters the Bus details like Bus plate number, Bus Source and Bus Destination. These details are stored at back-end in SQLite database. These details include the schedule of Bus, and route of Bus. Server fetches these details by having link between Application and Server.

2) **Fetching Bus Location**: In this module, Bus Locator Application will fetch the coordinates from Google Map at Background so that it should not affect any other activities of device. By the time when device changes its location it will fetch the co-ordinates and sends these co-ordinates to the Server. These co-ordinates are in terms of longitude and Latitude

B. Modules at User side

1. User Login.
2. Graphical-Map.

1) **User Login**: This module consists of three sub modules, Source (From where user want to travel) and Destination (To where user want to reach), Show bus, Payment (if user want to pay online). In first sub module i.e. Source and Destination module, User will provide the source from where user want to travel i.e. Source bus stop name and Destination where user want to reach i.e. Destination bus stop name. This sub module is to have interaction between User and Server.

2) **Graphical-Map**: This module displays Graphical Map of Real-time location of bus. When the application is running at Driver side it will fetch co-ordinates of device; further Driver application will send these co-ordinates to Server. Then Application locates these co-ordinates in Graphical Map by having markers on it.

V. CONCLUSION

By using GPS enabled Android device in every bus we can Track each and every bus from central location. Thus, reduces the traffic problems and leads to the better work. This project reduces the risk of losing signals by the time of bad weather as compared with GPS receiver hardware device. The GPS service will help to take the guess work Out of bus arrival at the stop. Project was great opportunity for us to learn and work in the Android environment. Considering the features of project such as Bus Locator, Graphical Map. We hope that our application will play an important role.

Smartphone Based Free to Needy Application for   Urban Development

Prof.Itrat Fatema[1],Aishwarya Shende[2], Azra Parveen[2], Zeeshan Qureshi[2], Zubair Khan[2]
[1]Professor, Department of CS , Anjuman College Of Engineering & Technology ,Nagpur , Maharashtra, India
[2]Student,Anjuman College Of Engineering & Technology, Nagpur, Maharashtra, India

ABSTRACT

Smartphones are increasingly integrated with everyday uses. It utilize for various activities like e -commerce, social media, a messaging, a chart and map location application. A problem of waste food becomes a critical issue and it affect the social and environmental problem. Every time food is wastage the other sources water, energy, time, manpower, land, fertilizer, packagin g and mainly money is also wasted. Food waste is big problem in India and it directly affect to the financial benefits. When huge quantity of food goes wasted instead of hungry mouths, it ends up in landfill means ultimately contributing to global warming by releasing methane gas. According to survey 40 percent of food is wasted from hotels and restaurant, marriage fun ction, family function and household estimated that millions of rupees food is wasted every year in a country. Yet millions of people are h ungry and in need of nourishment to overcome this problem we are proposing to new idea to facilitates the exchange in web based services here charity can easily find, secure and then deliver food to those who need it. This is the client-server GIS and Smartphone application for the hunger free city. At the client side App provide facility to donate food to the charity for the help of hungry people. Donors enter basic information like quantity of waste food and type of waste along with latitude and longitude value and contact number. Charities can pick up that waste food and deliver food to hungers. Charities can mapped onto Google map with the help of GIS location based services using GIS coordinate (latitude and longitude) value. Completion of registration will placed onto server database where charities can store the entries of donor in table format and shows the optimal path between donor locations to nearest charity along with direction. So wastage food can easily deliver to hungry people within a time.
Keywords: PhoneGap, GIS, Waste Food, API, LBS, Google Map, GPS .

I.   INTRODUCTION

The idea is to helping the Social Organization. Free to needy application is an urban development mission. Free to needy program is focused towards distributing raw food material, groceries, cloth and student scholarship to needy person of city. This application will help to enhance economic growth, sustainability, good quality of life. The cascade of wireless technology and Mobile devices are creating an impact on our lives. Smart phones are assumed to be the first communication and computing media for any real time task. With uses of social media, "netizens" are now pleasant with very often

updating their current going activities or social profiles with their locations [1]. This new reference of information, signals from social micro blog programme, has been found to be principally useful in relief operations and disaster management. According to a report from researchers and survey, Smartphone or mobile applications are used by huge number of user globally. Whatever you are, a retailer, businessman or commerce e-web site, Smartphone is easier to access it than anything else. Smartphone market enormously grows over past decade and still growing, with these it is new frame for internet. It is like missing major market opportunity over available smartphone resources. Smartphone adoption has accelerated like never before [2].

Smartphone's have various functions to support different user intersects. GPS in Smartphone's offer location geo-position and this will be helpful for waste food supply chain. In this research paper the tools are useful for managing the waste food and can easily find, secure and deliver food to those who need it. App provide web based cum geo-location based services to provide large quantity of waste food from hotels, marriage and family function, canteens, household to the hungry people in a city through the charity [3]. As a food donor you can post the amount of excess food you have to available and time required to pick the food up. The charity can request the food. Afterword's, the charity will be held responsible for picking up the food in a seamless and efficient manner.

The food waste in India is a critical problem it directly affect to the social, environmental and mostly financial benefits. According to the survey, near about 40 percent food is wasted, which would be through to feed 300 millions of hungry people in India per year. Stats studied by ministry of agriculture India, food worth 50k crore was wasted annually. Municipal Solid Waste report that higher percent of waste food going in municipal landfills. India was ranked 78 hungriest country, comprehensively worse than SAARC countries surrounding to India. Though India GDP had improved and also bring good life style changes– its index of Hunger has improved to 21.3 (2013) over 32.6 (1990). UNFAO states that one-sixth citizen of India could not able to get food. Instead, one-fourth global below-nourished population belongs India, more than in all of Sub-Saharan Africa. More painful, 35 % of the global population between 3-16 years age group are malnourished endemic in India. UNICEF stats that, approximately half population Indian between 3-16 years age group have below BMI (Body Mass Index) weight. Location based services are mobile IP-capable application. Information related to devices (mobile, car, missile etc.) location is fetched by location based services from defined coordinates. Location Based Services could be managed to provide information via mobile application with options like Restaurant, Hotels, Cinemas, Bus stands, railway station, Airport and main landmarks in city with either query based search or direct selecting already provided options described above with nearest one and distance from current position of device. They may be also in push based with coupons delivery or other marketing options within application frame for particular geo-location for customers [6].Important and necessary components of LBS are the service provider's software application, a mobile network to transmit data and requests for service, a content provider to supply the end user with geo-specific information, a positioning component and the end user's mobile device. Location-based services must be permission-based [7]. In LBS end user must compromise his devices with software application to share own device location. The

satellite image of Aurangabad city is utilized to extract the field of interest in current research paper, but user can use this application at any city. As it uses Google places API as a spatial data so that mapped placed information extracted from it and used as for waste food management purpose. For demonstration, we consider Aurangabad city as a study area to facilitate services to the organization [8]. Motive of this paper is to allocate services for hungry people, by using Smartphone technology time required to find the donor place with precise geo-location determination. Smart phones geo-locationing manage to collect food from donor location and deliver food to distribute among hungry people within time before food perish.

II. RELATED WORK

Section include examination of existing methods and current system methods for no food waste. The waste management mainly deals with calling the charity to get wastage of food and serve to needy peoples, but the amount of time required to do the procedure is more. Proposed no food waste supply chain is for the urban Areas city with coordinates 19.88°N 75.32°E [9].the related work is divided into two parts (a) current methods used in Aurangabad city (b) Available different methods for no food waste management's.

2.1 Existing Method

Aurangabad waste in a city: Senior citizen group and city- based NGO joined thirty party organiser, to donate excessive food, which usually got waste to admitted patients with their relatives outside the town. NGO already made these food available for 500 and more population free-of- cost who can't prepare their food by them self. After initiation, NGO has been capable to serve 1k population. Every day serving by this organisation include

home baked food comprising all essential parts of meal. Serving both lunch and dinner both they are contributing too much for society. Parcels for patients who are under-treatment also made available [10].

2.2 Different Method For No Food Waste 1) No Food Waste: A registered mobile based solution in the form of mobile application "No Food Waste" provide management of excessive food. The process of food management include collection from enthusiastic donor, sorting out the food, packaging the food and finally deliver food to the needy before it perish. The user can share the food to available registered Charity. User can find Charities near to the location and can deliver them self, user will get the root map assistance to charity which will easy to reach desired location. Otherwise all the user need to do is to upload the food images in the app and immediately all the volunteers will get notification and will contact you to pick up the food and serve to charity, the user can also track the status of food up to delivery. Those who ready to act as a volunteer can register as a volunteer in the app itself and can collect food from different donors and serve to Charity. [11] [12].No food waste mobile app perform on following operation.
 Call Us:Request a pickup of leftover food. Quality Check: Once we reach your pickup point, we check for food quality. Locate Needy: We reach our spotted places such as ashram, slums, age care for food distribution. Deliver Food: Deliver excess food to needy place securely.
2) Waste No Food: Waste no foods technology platform endorsed by the city of San Jose, Silicon Valley Talent partnership allowed excessive food to collect from the industrial manufacturer of food to charities who are qualified and genuinely providing food to hungrier one. About all 31% food is perished or dumped, from various sources including

farms, grocery stores, bakery and restaurant. Reason for that is improper grouping of excessive food producer and impractical methods to donate it to Californians and Americans hungrier population. Smartphone based application Waste No Food is that platform for donors. Signing up by person on this application, provides efficient ways to donate their excessive which rather tends to dump, decomposed or perished. A registered qualified charities near vicinity of donors who have been verified by this application, could claim the food. Handling and Transporting of food is solely depend on respective registered charities [13] [14].

III. METHODOLOGY

It is a mobile based application which will consist a database system for all the registered users as well as track of fund and expenditure which will be transparent for all the members to their personal profile. registered members can donate directly to the organization bank account via e payment. Registered members will be verified by linking "Aadhar Card" number. Registered member can inform the NGO about the needy person/family by posting address and personal detail and NGO's verification team can verify whether they are actually needy or not. if they are legit person they will be benifited . Registered members can also chat directly in the application's chat section for discussion about particular cases.

3.1 Proposes Methodology
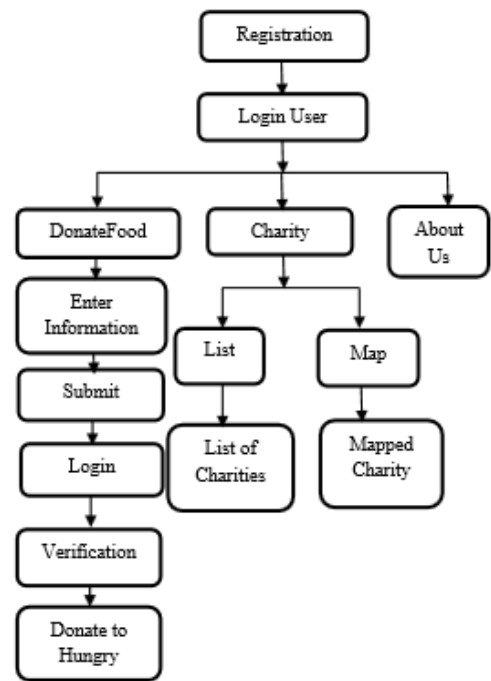
Figure 1. Workflow for Client-Side

Brief description:

- This module of the project will introduce the very first page of the application where user can sign in before using the application further.
- Application is embedded with one click sign-in.
- One click sign is used so that user can easily register themselves.
- User can see all the options regarding donation after registration to get an idea about the application.

Client side application workflow shown in figure 1.

It divided into three part. Donor can firstly register on app then login it. After completion of login there are three option donate food, charity and about us. First phase are donate food select the donate food option enter the whole information like food type, food quantity, latitude and longitude

value, donor name and contact number. Data are saved on to the web server application then charity checks for the verification. After find the food deliver to the hungry people. Secondly click on charity it shows the list of charity and mapped charity on Google map select the nearest charity from donor location. Last is about us can provide the information about the application.

2) Server Side Methodology:

Server side application workflow shown in fig.2. On server side it stored the list of donor by date wise so we can easily analysis which type of food is more wastage and from where so it is beneficial for the future requirement. Secondly it is more important to show the optimal distance between donor to charity and donor to needy. Charity can contact to the donor and needy resp. and take responsibility for transportation and deliver to needy securely.
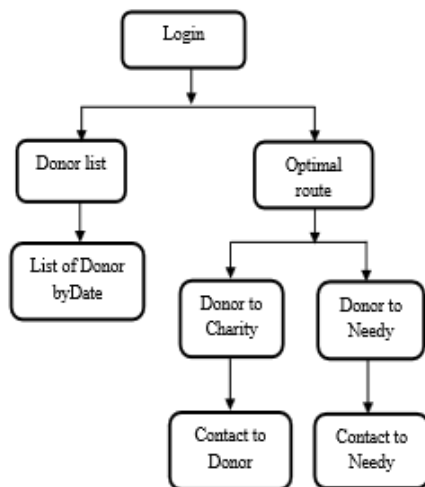
Fig -2 : Workflow for Server-Side

3.2 System Overview

The system architecture is divided into 3 parts, the development of the client side which is cross-platform Smartphone app which consist of by food donation part. Firstly they register and provide the

information and submit. The Google web services used for getting the nearby search charities from the current location of donor in Smartphone app which provide mapping of the nearby charities on to the Google mobile maps along with fetching required information that user wants at the time of donate food such as geo-location of place, mapping facility to see on to the Google maps. The haversine equation is used to compute the distance between donors to charities and donors to needy geo-location by using geo-coded address form donor search current address and provide all services under required distance. Integrated steps involved to design the system are as follows.

1) Smartphone User Interface:

Waste application consists of cross-platform PhoneGap app which can run in all major operating system such as Android, iPhone, Windows. App consist of providing supply chain facility such as quantity of waste food. Web based services allowing quantity of waste food to be donated from the donor location (eg. Hotel, restaurant, wedding halls etc.) tocharities.GIS location based services search nearest charities from the donor's location. Then Charities can easily find, secure and deliver food to those who need it.

2) Configuration of Map on Device using Google Web Services:

To use nearest location Google facility on to the Smartphone, we register onto the Google console, which provide different web services such as for used Google maps on to the mobile we need to generate server-key from console and used onto the device. To display maps onto the device we need to use Google maps followed by key and type of
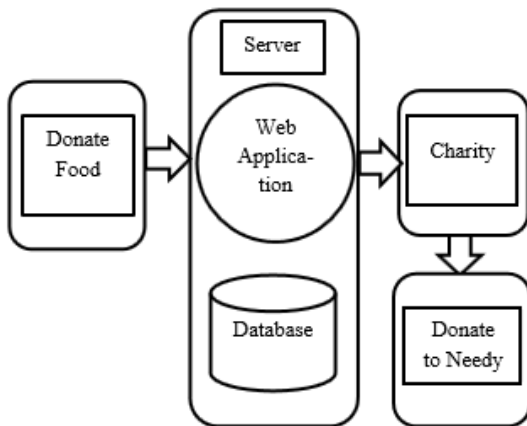
quantity of food charity wants too used.

Fig -3 : System Architecture

3) Build Web Server:

The PHP and MYSQL are used to design the web application server which is used to display all the donor information are registered and submit to the charity. Web mapping Facility (WMS) is used to point all charities from the Google maps web services and GIS location based services are for displaying addresses from client position onto the maps.

4) Build Client-Server Intermediate:

JSON (JavaScript Object notation) is an insubstantial data exchange format along with AJAX request helps to make web service connection in between client and server [15]. After the requirement is completed, the charity volunteer have been visited in place of donor person and deliver food to needy.

3.3 Technologies Used

Under this study several technologies were used for the development of supply chain client-server application with all the necessary technologies works in their original form. It is important to remember that some technologies are present only in the client (PhoneGap, SQLite,JQueryMobile), some only in the server (PHP,MYSQL) and some are found on both (JSON).

1)PhoneGap:

The idea for the client was similar to the Java motto, "write once, run anywhere", pursuing to overcome the handicaps of different programming languages and very heterogeneous systems for today's mobile devices [16]. PhoneGap is a software evolution structure by Adobe System, which is utilize to develop Smartphone applications. To utilize apps using PhoneGap, the developer does not require having knowledge of mobile programming language like for android we need knowledge of Java Programming, for IOS app development objective C++ knowledge is necessary, but only web-development and design languages like, CSS, HTML and JavaScript. PhoneGap utilizes and developed apps for all popular mobile OS platforms such as iOS, BlackBerry, Android and Windows Mobile OS etc. With the help of apache cordova (Adobe software, previous PhoneGap) in visual studio 2015 Enterprise we develop cross-platform application for waste food supply chain.

2) JQueryMobile:

JavascriptQueryMobile [17] is JavaScript libraries for developing mobile application and it is also a user interface structure based on JavaScript Query that works across all popular phones, desktop platforms. Based on services and universal entrance in mind, it follows responsive web outline and HTML5 markup-design configuration makes to learn easy using JQueryMobile.

3) HTML5SQL:

Transactions have been done using the html5sql library [18]: a module coded in JavaScript, implementing the Web SQL [19] API that eases the work with HTML5 Web Databases. The API is supported by the major web browsers (Chrome, Firefox, Opera, Safari...) including those available on the smart phones. To create local storage of

dataset we used HTML5SQL Technologies, in this paper for saving nearest location search places, favorites places are stored locally, also if user wants to add information before emergency situation occur, he can also add his details and saved locally, when emergency occurs, he can directly send information which is saved already on local database, in this paper information at the time of donate food consist of name of the user, contact number and quantity.

4) AJAX Technology with JSON:

AJAX [21] is acronym of Asynchronous JavaScript and XML. AJAX is a new skill for creating better, efficient, faster, and more user friendly web applications with the help of Extended Markup Language, HTML, Cascading Style shit, and Java Script. this is the web browser technology autonomic of software. Any data that is updated using Asynchronous JavaScript and XML can be stored using the JavaScript Object Notation format on the web server. AJAX is necessary and used so that JavaScript can fetch these JSON files when necessary, parse them, and execute one of the following operations:

 Accumulate the parsed utilities in the variables for further procedure before displaying them on the website page. It immediately allocates the data to the Document Object Model elements in the website page, so that they are mention on to the website.

Example: A Nearby Search request is a Hypertext Transfer Protocol Uniform Resource Allocator of the following form:

https://maps.googleapis.com/maps/api/place/nearby search/o utput?parameters where output may be either of the following values: JSON specify the execution in JavaScript Object Notation (JSON).
XML specify the execution of Extended Markup Language. Parameter consists of latitude, longitude, API-key (server- key) etc.

Table -1 : Donate Food Information

Sr. No.	Field	Description
1	Food Type	Type of food (Breakfast, lunch, dinner)
2	Quantity	Amount of dishes
3	Location Data	Latitude and Longitude GPS co-ordinates to get current location of donor
4	Donor Name	Name of donor (Hotel owner, House owner)
5	Contact Number	Contact Number of Donor
6	Time	Food Donation Time

5) GIS Location based Services: Comprehensively there are number of elements in services based on location for applications on different platform. Elements collectively form the services based on location comprises of Google MapsTM, Geo-locationing Information services and system, geo-location data collection services with LBS (Location Based Services) as specific application subcomponent. For current or a known geo-location LBS considered as best application platform which is supported by map based on electronic platform/ framework. Information regarding latitude and longitude coordinates for geo-locationing can be acquired by mobile network and world/global navigation system (GPS) [19]. It facilitate modified and defined services to stationary and mobile customers with respect to their current position using global navigation satellite system, geographical information system (GIS) [20], wireless communication (WC) technology platform.

6) Google Places API Web services:

The Google Places Application Programming Interface Web Service that details information about searched geo- locations expressed within API(Application Programming Interface) as points

of interest and established geo-location using Hypertext Transfer Protocol requests.

The following requests for available places are as below: Place searches: it returns list of places from user's current location after placed strings in user query.   Place details: it provides more detailed information including review of users, rating, posts and distance from current geo-location of specific place. Place Add: allows users to supplement the contents in Google's Places database with data from the user's application.   Place Photos: It gives users to access to the millions of geo-location related photos stored in Google's Place database. Place Auto complete: it is used automatically to fill in the name and address of a place as you type. Query Auto complete: It is used to provide a query prediction service for wording-based geographic searches, by returning recommended queries as you type.

IV. EXPERIMENTAL WORK

4.1 Data Collection

The GPS data (geospatial locations) of charities and the needy place is collected by the field survey. The database of charities and needy place consist of various fields like name, address, quantity of requirement, area, pin and phone number. This database also consist of location information in the formofmap coordinate as well as attribute data. Location of standard data was collected using handheld GPS monitoring device.

4.2 Working Flow Of GUI

We design GUI for waste food supply chain to the hungry people with exact geo-location (latitude and longitude) using GIS Location based service technology.
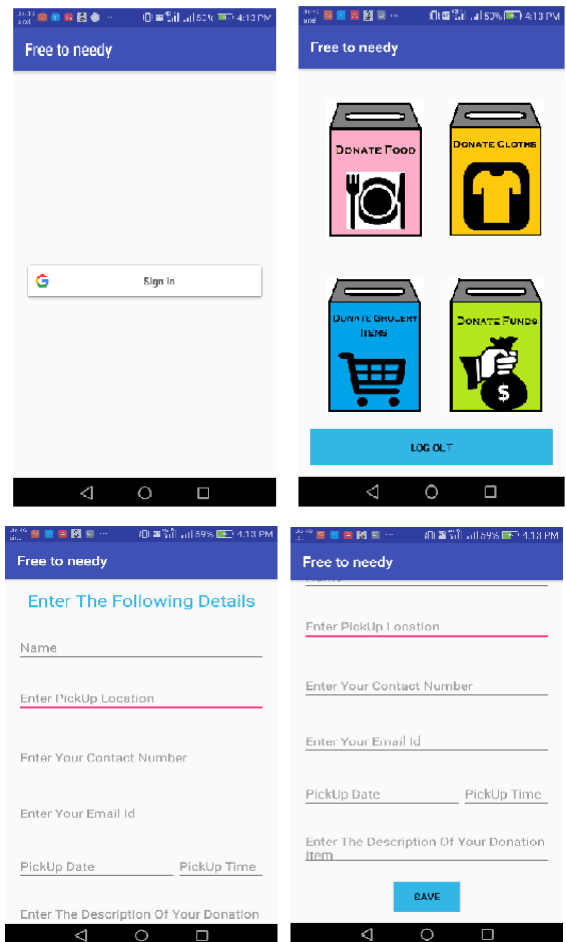
Figure 4. GUI of Smartphone Waste Food Supply Chain App

Register: Donor request a pickup of leftover food through app.

- Locate Donor: locate the optimal route between charities to donor.
- Quality Check: once we reach your pick point we check for food quality and deliver food to needy place.
- Locate Needy: we reach our spotted places like city slum area, medical hospital, ashrams, temples etc.
- Deliver Food: we then distribute the food pack to hungers and insist them not to waste food.

4.3 Result Analysis

The GUI of application contain the physical address in the form of visual map loaded on window of

application, so user could pick up address of concern party. The location of both parties was accessed by maps in attributed and coordinates form. To access and identify the address a reverse geocoding algorithms was used with coordinates. The address of user location get in text frame boxin GUI form. Now it's on registered charity organisation to choose places where food need to be deliver. Required information was fetched from the database on the server as per the demand by the service application with charity name and distance of order from present location in GUI form [22]. Then willing donator could choose any registered charity organiser name as his ease to access them or according to order. After that application provide details information of nearest route with the direction. So it is easy for charity to collect waste food as much as possible within a time and deliver to the needy.

V. CONCLUSIONS

1. This paper gives an idea about new waste food supply chain system using GIS Location based and Google web services using Smartphone's by providing the help by charity. It responds to hungry in our city and food waste management fulfils the requirement of ad-hoc communication between donor and charity.

2. Waste management never comes with prior information, using this location and GIS integrated mapping system we can automatically detect precise location (latitude and longitude) of the donor and needy and provide services from charity team.

3. In this paper, we add another option for communication using mobile and web technologies for waste food supply chain and response. This will help for fast and efficient to deliver food to those who need it. Our goal is not just create supply chain

and response protocol, in modern day we have enlarge the use of Smartphone's which a source act like a medium and to help peoples , save their lives and make our city hunger free.

4. In future, we can make more precise client-server application to help peoples by analysing from the previous database records and make predications on how much waste food is generated in a day and how much people are hunger in day. Even further we can make the provision of sending the pictures of waste food supply chain situations with geo-tagged images.

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"Gas Insulated Substation"

Mirza Rehan Baig[1], Yasmin Ansari[2], Syed Tahir[2], Shahid A. Ansari[2] , Yasser A. Sayeed[3]
[1]Electrical & Power from RTMNU, Nagpur Maharashtra, India
[2]Department Electrical Engineering, Anjuman college of Engg.& Tech., Nagpur, Maharashtra, India
[3]Electronics & Power Engineering from RTMNU, Nagpur Maharashtra, India

ABSTRACT

Reliable and economical power transmission and distribution are key functions for the future electric power supply. Gas insulated switchgear is used in industrial areas to fulfill high-energy demands by space saving design with a minimum of cost. Only SF6 insulated switchgear is able to fulfill these requirements. SF6 switchgear installed in Canada in a 550 kV substation with 100 kA as the highest breaking capacity ever achieved in one of the steps of development since then. Consistent research and development and innovative energy led to the third generation of nowadays compact and overall optimized switchgear. The advantages of gas-insulated switchgear are its compact design and the modular system. The standardized modular structure is made to match the various customers' specifications and allows realizing almost all substation configurations in compliance to them

.

I. INTRODUCTION

A gas-insulated substation (GIS) uses a superior dielectric gas, SF6, at moderate pressure for phase-to-phase and phase-to-ground insulation. The high voltage conductors, circuit breaker interrupters, switches, current transformers, and voltage transformers are in SF6 gas inside grounded metal enclosures. The atmospheric air insulation used in a conventional, air-insulated substation (AIS) requires meters of air insulation to do what SF6 can do in centimeters. GIS can therefore be smaller than AIS by up to a factor of 10. A GIS is mostly used where space is expensive or not available. In aGIS the active parts are protected from the deterioration from exposure to atmospheric air, moisture, contamination, etc. As a result, GIS is more reliable and requires less maintenance than AIS.GIS was first developed in various countries between 1968 and 1972. After about 5 years of experience, the use rate increased to about 20% of new substations in countries where space is limited. In other countries with space easily available, the higher cost of GIS relative to AIS has limited use to special cases.

System Architecture:

Methodology

Fig: essential parts of Gas insulated substation

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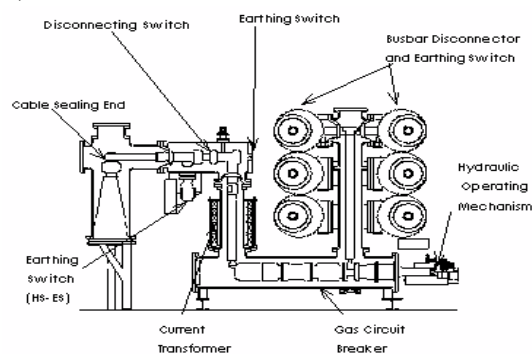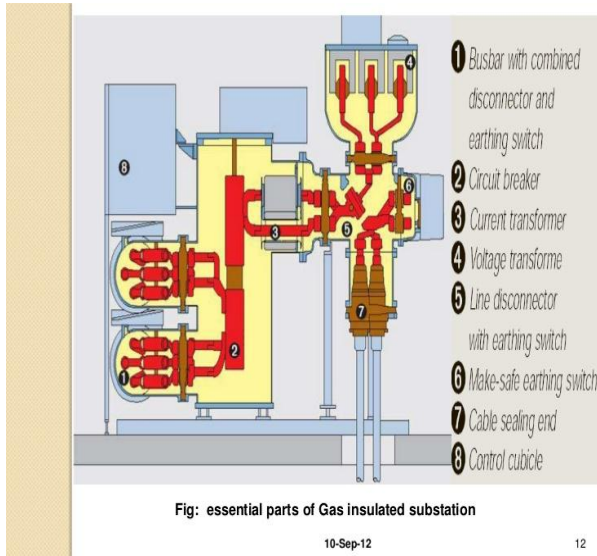
BUS BAR

Three phase conductors made of aluminum or copper, depending on the current rating, are supported by gas tight insulators.

Disconnectors and Earthing Switches

Line disconnector combined with a maintenance earthing switch forms a three-position switch. Busbar disconnectors are assembled in each busbar compartment. One of them is combined with a maintenance earthing switch and forms a three-position switch. The disconnector has a switching capability of bus-transfer current, small capacitive current as bus charging and small inductive current as transformer magnetizing current, if required. Earthed side of the earthing switch is brought out from the earthed metal housing and earthed to it through a removable link for primary injection test. Disconnectors and earthing switches are normally motor or manual-operated.

The make-proof earthing switch is provided with a motor-charged spring operation mechanism.

Current Transformer

The current transformer is of foil-insulated type with ring core mounted in the CB enclosure. SF6 gas provides the high-voltage

insulation. A separate compartment is available upon request.

Voltage Transformer

The voltage transformer is of induction type. SF6 provides the high-voltage insulation.

Surge Arrester

The surge arrester consists of zinc oxide (ZnO) element with excellent low residual voltage characteristics and long service life

Where and Why Gas Insulated Substations are used Gas Insulated Substations are used where there is space for providing the substation is expensive in large cities and towns. In normal substation the clearances between the phase to phase and phase to ground is very large. Due to this, large space is required for the normal or Air Insulated Substation (AIS). But the dielectric strength of SF6 gas is higher compared to the air, the clearances required for phase to phase and phase to ground for all equipment's are quite lower. Hence, the overall size of each equipment and the complete substation is reduced to about 10% of the conventional air insulated substation.

Locations where Gas Insulated Substation is preferred:

- Large cities and towns
- Underground stations
- Highly polluted and saline environment Indoor GIS occupies very little space

- Substations and power stations located Off shore
- Mountains and valley regions

Merits of SF6 Gas Insulated Substation:

Safe: Gas insulated Substations are very safe and operating personnel are protected by the earthed metal enclosures. While the Substation in operating condition the Operating personnel can touch the compartment.

Reliable: The complete enclosure of all live parts guards against any impairment of the insulation system.

Space Saving: SF6 switchgear installations take up only 10% of the space required for the conventional installations.

Economical: Initial high investment is required for installation but the cost can be comparable for the less maintenance, reliable, safe operation against conventional substation.

Maintenance Free: An extremely careful selection of materials, an expedient design and a high standard of manufacturing quality assure long service life with practically no maintenance requirement.

Low Weight: Low weight due to aluminum enclosure, corresponds to low cost foundations and buildings.

Shop assembled: Quick site assembly ensured by extensive pre assembly and testing of complete feeders or large units in the factory.

Demerits Of Gas Insulated Substation:

- Cost is higher compared to Air Insulated Substation or conventional substation.
- Procurement of SF6 gas and supply of gas to the site is problematic

- Normally this type of substations are indoor type and requires separate building
- Maintaining Cleanliness is very important. Dust or moisture inside the compartment causes the flash overs
- When fault occurs internally, the outage period will be very long. The damage effect will also be severe

II. CONCLUSION

- GIS-necessary for extra HV and Ultra HV
- Some important areas to be studied include
- More conservative design
- Improved gas handling
- Decomposition product management techniques
- Achieving and maintaining high level of availability require more integrated approach to quality control by both users and manufactures.

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I have personaly worked on project of 220/33 kV GIS substation in Odisha first of its kind for OPTCL (ODISHA POWER TRANSMISSION CORPORATION LIMITED)

Review on Detection of Error and Correction of Corrupted Code Using Fpga Implementation

Yogeshwari Paidlewar¹, Shagufa Anjum², Zubaida Khatoon², Naghma Tarrannum²,Prof. Mohsina Anjum²

¹B.E. Student, Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India

²Asst. Prof., Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

In this paper, the error detection and correction of the corrupted code is done by FPGA implementation using Xilinx and Modelsim software. In information theory and coding theory with applications in computer science and telecommunication, error detection and correction or error control are techniques that enable reliable delivery of digital data over unreliable communication channels. When data is stored, compressed, or communicated through a media such as cable or air, sources of noise and other parameters such as EMI, crosstalk, and distance can considerably affect the reliability of these data. Error detection and correction techniques are therefore required. Many communication channels are subject to channel noise, and thus errors may be introduced during transmission from the source to a receiver. Error detection techniques allow detecting such errors, while error correction enables reconstruction of the original data in many cases. In coding theory ,hamming (7,4) is a linear error-correcting code that encodes four bits of data into seven bits by adding three parity bits.Hamming's (7,4) algorithm can correct any single bit error ,or detect all single-bit and two-bit errors.

Keywords: Error detection and correction, FPGA, Hamming code, Xilinx and Modelsim.

I. INTRODUCTION

In information and communication technology, when data is stored, compressed, communicated through a media such as cable or air, sources of noise and other parameters such as EMI, crosstalk, and distance can considerably affect the reliability of these data. Error detection and correction techniques are therefore required. Error coding is a method of detecting and correcting these errors in a wide range of communication systems in computer memory, magnetic and optical data storage media, satellite and deep space communications, network communications, cellular telephone networks, and almost any other form of digital data communication Digital data is transmitted over a channel and there is often noise in the channel. The noise may distort the messages to be sent. Therefore, what the receiver receives may not be the same as what the sender sends. The goal of error coding is to improve the reliability of digital communication by error detection and error correction. In this paper we have written Verilog code for finding error location and correct the bit which is

corrupted. At the destination, we receive 7-bit of data with 4 redundancy bits. This received data may be corrupted due to noise. To remove this noise we find the address of the error bit then correct them. To find the location of error bit and correct them we write code in Verilog language. This paper is organized as follows: the concept of hamming code along with the application of it, Verilog language, Why Verilog is preferred over VHDL, Implementation of hamming code, Performance and experimental results, conclusion and references.

1. HAMMING CODE

In telecommunication, Hamming codes are a family of linear error-correcting codes that generalize the Hamming (7, 4)-code . Hamming codes can detect up to two-bit errors or correct one-bit errors without detection of uncorrected errors. By contrast, the simple parity code cannot correct errors, and can detect only an odd number of bits in error. Hamming codes are perfect codes, that is, they achieve the highest possible rate for codes with their block length and minimum distance of three.

To improve system reliability, a designer may wish to provide an automatic error detection and correction circuit. One such example is the data communicated from the microprocessor to peripheral memory devices. This document describes a flow-through method for doing data SECDED. In this design, multiple parity bits are added to the data word upon a write to memory. With multiple parity bits, both single and double data errors can be detected upon reading the word from memory and correct single data errors. The system provides a 2-bit error output flag for the microprocessor to handle detected double errors.

The SECDED design described here is the combinational logic for data communication between the microprocessor and memory. The data bus from the processor is 16-bit wide data, while the data written to memory is a 22-bit data word. When data is read back from the memory device, the stored parity bits are compared with a newly created set of parity bits from the read data. The result of this comparison, called the syndrome, will indicate the incorrect bit position in a single data error.

This design is a model of the Hamming code developed by R. Hamming. SECDED for N bits of data requires K parity bits to be stored with the data where:

$N <= 2K - 1 - K$

If the bits are numbered in sequence, those bit positions that represent powers of two are dedicated to parity bits. Table 1 illustrates how the 16-bit data word and parity bits are stored in memory.

Table 1. Hamming code data and parity bits

Bit Position	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Bit Number	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Data/Parity Bit	P5	D15	D14	D13	D12	D11	P4	D10	D9	D8	D7	D6	D5	D4	P3	D3	D2	D1	P2	D0	P1	P0

The parity bits P0-P4 are created for single error detection and correction and are created as follows:

PO=D15⊕D13⊕D11⊕D10⊕D8⊕D6⊕D4⊕D3⊕D1⊕D0
P1=D13⊕D12⊕D10⊕D9⊕D6⊕D5⊕D3⊕D2⊕D0
P2=D15⊕D14⊕D10⊕D9⊕D8⊕D7⊕D3⊕D2⊕D1
P3=D10⊕D9⊕D8⊕D7⊕D6⊕D5⊕D4
P4=D15⊕D14⊕D13⊕D12⊕D11

One additional parity bit, P5, detects double errors that are not correctable. This extra parity bit is an overall parity bit and is comprised by XOR-ing all the data bits, D15-D0 and parity bits, P0- P4.

The syndrome is created upon a memory read and provides the ability to correct single bit errors. The syndrome is created by XOR-ing the parity bits read out of memory with the newly created set of parity bits from the data stored in memory. The value of the syndrome will indicate the bit position in error (if a single error has occurred). Table 2 illustrates the value of the syndrome and the overall parity bit in detecting both single and double errors.

Table 2. Error detection flags

error_out[1:0]	Description
00	No error has occurred.
01	Single error has been detected. Syndrome holds value of erroneous bit.
10	Double error has been detected. Not correctable
11	Parity error has occurred. Correctable.

Figure 1 illustrates the block level design of the SECDED. The left side of the diagram illustrates the processor interface. This interface consists of the 16-bit processor data bus, u_data [15:0], the read/write control signal, rw_n, and the error flag signal, error_out [1:0]. The right hand side describes the memory component interface, consisting of the memory data bus, mem_data [21:0].

The rw_n control signal from the processor switches between read and writes cycles. The rw_n signal will be equal to "1" for a processor read cycle and equal to "0" for a processor write cycle.
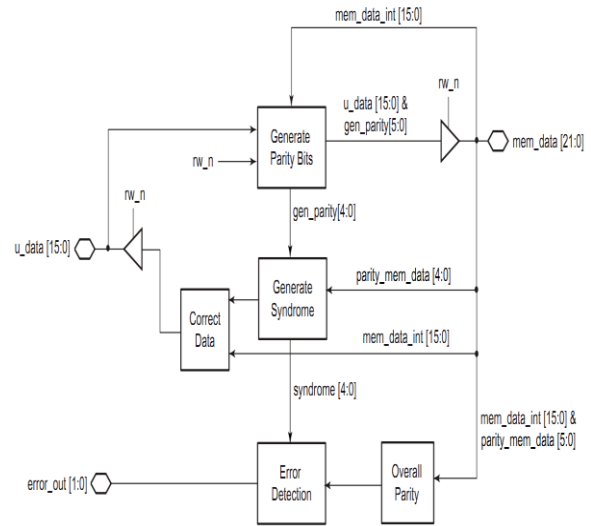
Figure 1. Block diagram of SECDED

The "Generate Parity Bits" block creates the parity bits to store with the processor data (u_data [15:0]) during a write cycle. In a read cycle, this block is also responsible for creating one of the inputs in generating the syndrome; this block creates the parity bits with the data word stored in memory.

The "Error Detection" block generates the error_out [1:0] flag based on the syndrome and the overall parity created from the data in memory.

2.SINGLE BIT ERROR: The term single-bit error means that only one bit of given data unit (such as a byte, character, or data unit) is changed from 1 to 0 or from 0 to 1.The following fig shows the

detection of single bit error on the software.
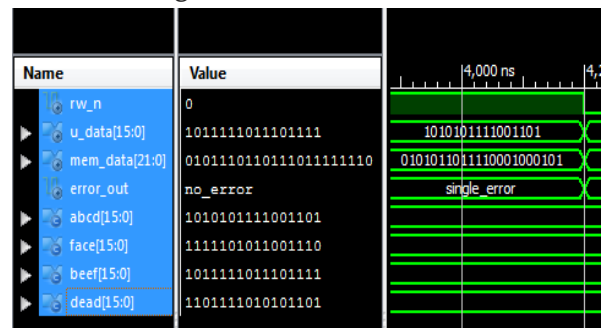
Figure 2. Single Bit Error Detection

3.DOUBLE BIT ERROR: Double bit errors in a Hamming code cause trouble. Two bit errors will always be detected as an error, but the wrong bit will get flipped by the correction logic, resulting in gibberish. If there are more than two bits in error, the received codeword may appear to be a valid one (but different from the original), which means that the error may or may not be detected.
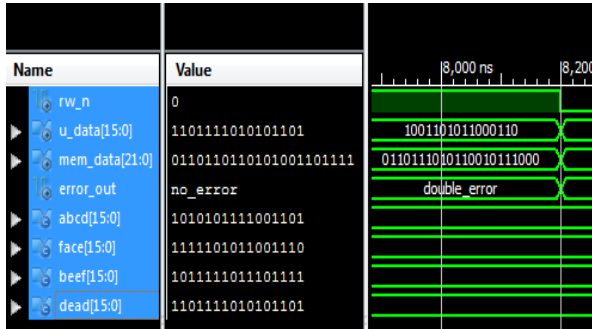
Figure 3. Double Bit Error Detection

4.PARITY ERROR: A parity bit, or check bit, is a bit added to a string of binary code to ensure that the total number of 1-bitsin the string is even or odd. Parity bits are used as the simplest form of error detecting code.
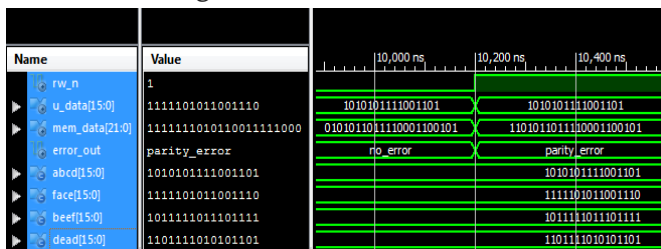
Figure 4. Parity Error Detection

FPGA:

After a design passes basic the functional validations, it must be synthesized into a netlist of components of a target library. The target library is the specification of the hardware that the design is being synthesized to. A field-programmable gate array (FPGA) is an integrated circuit (IC) that can be programmed in the field after manufacture. FPGAs are similar in principle to, but have vastly wider potential application than, programmable read-only memory (PROM) chips. FPGAs are used by engineers in the design of specialized ICs that can later be produced hard-wired in large quantities for distribution to computer manufacturers and end users. Ultimately, FPGAs might allow computer users to tailor microprocessors to meet their own individual needs. We have show some results of detection above. The following figure shows the flow of the project.

II. CONCLUSION

In this paper, the conclusion can be made as this is the case in computer memory, where bit errors are extremely rare and hamming codes can be widely used. Extended hamming codes can achieve a hamming distance of four, which allows the decoder to distinguish between when at most one bit error occurs and when any two-bit error occurs. In this sense, extended hamming codes are single error correcting and double error detecting, abbreviated as SECDED.

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"Identification of Fake Currency Using Matlab"

Apurva Rangari, Asina Khan, Alfiya Sadaf, Priyadarshini Das, Asst. Prof. Tirupati Goskula

Department of Electronics & Telecommunication , ACET, Nagpur, Maharashtra, India

ABSTRACT

The use of counterfeit currency is one of the major issues faced throughout the world nowadays .The counterfeiters are becoming harder to track down because of their use of highly advanced technology. One of the most effective methods to stop counterfeiting can be the outspread use of various counterfeit detection tools/software that are easily available and are efficient .This is a MATLAB based application which will help recognize a bank-note based on its denomination on an application window. The method will be based on image pre-processing followed by a classification of note. This article describes extraction of various features of Indian currency notes. MATLAB software is used to extract the features of the note. The proposed system has got advantages like simplicity and high-performance speed. The result will predict whether the currency note is fake or not.

Keywords: Fake Currency, Image Pre-Processing, Feature Extraction, Recognition, SURF

I. INTRODUCTION

Technology is growing very fast these days. Consequently the banking sector is also getting modern day by day. This brings a deep need of automatic fake currency detection in automatic teller machine and automatic goods seller machine. Many researchers have been encouraged to develop robust and efficient automatic currency detection machine. Automatic machine which can detect banknotes are now widely used in dispensers of modern products like candies, soft drinks bottle to bus or railway tickets. The technology of currency recognition basically aims for identifying and extracting visible and invisible features of currency notes. Until now, many techniques have been proposed to identify the currency note. But the best way is to use the visible features of the note . For example, color and size. But this way is not helpful if the note is dirty or torn. If a note is dirty, its color characteristic are changed widely. So it is important that how we extract the features of the image of the currency note and apply proper algorithm to improve accuracy to recognize the note.

We apply here a simple algorithm which works properly. The image of the currency note is captured through a digital camera. The hidden features of the note are highlighted in the ultraviolet light. Now,processing on the image is done on that acquired image using concepts like image segmentation, edge information of image and characteristics feature extraction. MATLAB is the perfect tool for computational work, and analysis. Feature extraction of images is challenging task in digital image processing. It involves extraction of invisible and visible features of Indian currency notes. This approach consists of different steps like

image acquisition, edge detection, gray scale conversion, feature extraction, image segmentation and decision making. Acquisition of image is process of creating digital images, from a physical scene. Here, the image is captured by a simple digital camera such that all the features are highlighted. Image is then stored for further processing.

II. METHODOLOGY

The system proposed here work here on the image of currency note under ultraviolet light acquired by a digital camera. The algorithm which is applied here is as follows

a) Acquisition of image of currency note under ultraviolet light by simple digital camera or scanner.

b) Image acquired is RGB image and now is converted to grayscale image.

c) Edge detection of whole gray scale image.

d) Now characteristics features of the paper currency will be cropped and segmented.

e) After segmentation, characteristics of currency note are extracted.

f) Intensity of each feature is calculated.

g) If the condition is satisfied, then the currency note is said as original otherwise fake.

A. In this method, characteristics of currencies are employed which are used by common people for differentiating for different banknote denomination. The characteristics that can be used to check the authentication of currency note are

1. See through Register : The small floral design printed both on the front (hollow)and back (filled up) of the note in the middle of the vertical band next to the Watermark has an accurate back to back registration. The design will appear as floral design when seen against the light.

2. Water marking : The Mahatma Gandhi Series of banknotes contain the Mahatma Gandhi watermark with a light and shade effect and multi-directional lines in the watermark window.

3. Fluorescence : Number panels of the notes are printed in fluorescent ink. The notes also have optical fibres. Both can be seen when the notes are exposed to ultra-violet lamp.

4. Security Thread : The Rs.500 and Rs.100 notes have a security thread with similar visible features and inscription „Bharat‟ (in Hindi), and „RBI‟. When held against the light, the security thread on Rs.1000, Rs.500 and Rs.100 can be seen as one continuous line. The Rs.5, Rs.10, Rs.20 and Rs.50 notes contain a readable, fully embedded windowed security thread with the inscription „Bharat‟ (in Hindi), and „RBI‟. The securitythread appears to the left of the Mahatma's portrait

5. Intaglio Printing : The portrait of Mahatma Gandhi, the Reserve Bank seal, guarantee and promise clause, Ashoka Pillar Emblem on the left, RBI Governor's signature are printed in intaglio i.e. in raised prints, which can be felt by touch, in Rs.20, Rs.50, Rs.100, Rs.500 and Rs.1000 notes.

6. Latent image : On the obverse side of Rs.1000, Rs.500, Rs.100, Rs.50 and Rs.20 notes, a vertical band on the right side of the Mahatma Gandhi‟s portrait contains a latent image showing the respective denominational value in numeral. The latent image is visible only when the note is held horizontally at eye level.

**7. Micro lettering :** This feature appears between the vertical band and Mahatma Gandhi portrait. It always contains the word „RBI‟ in Rs.5 and Rs.10. The notes of Rs.20 and above also contain the denominational value of the notes in micro letters. This feature can be seen well under a magnifying glass.

8. Identification Mark : Each note has a unique mark of it. A special feature in intaglio has been

introduced on the left of the watermark window on all notes except Rs.10/- note. This feature is in different shapes for various denominations (Rs. 20- Vertical Rectangle, Rs.50- Square, Rs.100-Triangle, Rs.500-Circle, and Rs.1000- Diamond) and helps the visually impaired to

identify the denomination.

B. Digital Image Processing Method To Detect Fake Currency

The design flow of fake currency detection system includes eight stages: Image acquisition, pre-processing, gray scale conversion, edge detection, image segmentation, feature extraction, comparison and output . This system is works on two images, one is test currency image on which authentication is to performed and other is the original currency image.
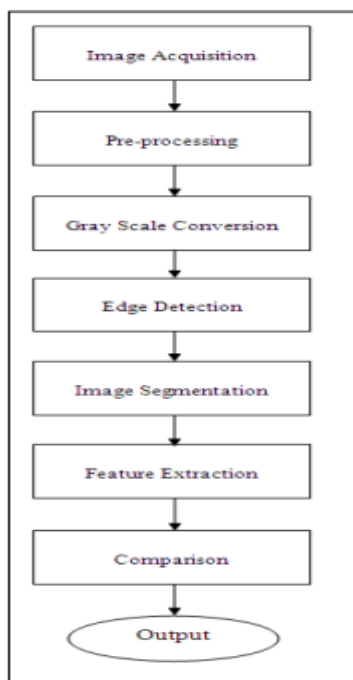
Figure 1. Flow Chart of Digital Image Processing Method To Detect Fake Notes

III. RESULTS AND DISCUSSION

1. Image Acquisition : There are various ways to acquire image such as with the help of camera or scanner. Acquired image should retain allthe features..

2. Pre-Processing : Pre-processing of image are those operations that are normally required prior to the main data analysis and extraction of information. The aim of image pre-processing is to suppress undesired distortions or enhance some image features that are important for further processing or analysis.

It includes

2.1 Image Adjusting :   When we get the image from a scanner, the size of the image is so big. In order to reduce the calculation, we decrease them size of image. Image Adjusting is done with the help of image interpolation. Interpolation is the technique mostly used for tasks such as zooming, rotating, shrinking, and for geometric corrections.

2.2 Image smoothening : When using a camera or a scanner and perform image transfers, some noise will appear on the image. Image noise is the random variation of brightness in images. Removing the noise is an important step when image processing is being performed. However noise may affect segmentation and

pattern matching. When performing smoothing process on a pixel, the neighbour of the pixel is used to do some transforming. After that a new value of the pixel is created. The neighbour of the pixel is consisting with some other pixels and they build up a matrix, the size of the matrix is odd number, the target pixel is located on the middle of the matrix. Convolution is used to perform image smoothing. Also image smoothening can be done with the help of median filter which more effective than convolution when goal is to simultaneously reduce the noise preserving edges. Median filter

replaces a pixel via the median pixel of all the neighbourhoods .

3. Gray-scale conversion: The image acquired is in RGB color. It is converted into gray scale because it carries only the intensity information which is easy to process instead of processing three components R (Red), G(Green), B(Blue)..

4. Edge detection : Edge detection is a fundamental tool in image processing and computer vision, particularly in the areas of feature detection and feature extraction, which aim at identifying points in a digital image at which the image brightness changes sharply or, more formally, has discontinuities. Edge detection is one of the fundamental steps in image processing, image analysis, image pattern recognition, and computer vision techniques.

5. Image segmentation : the image into its constituent

regions or objects. The level to which sub division is carried depends on the problem being solved. Segmentation algorithm for monochrome images generally are based on one of the two basic properties of image intensity values

 · Discontinuity
 · Similarity.

In the first category, the approach is to partition an image based on abrupt changes in intensity such as edges in an image. The approach in the second category is based on partitioning an image into regions that are similar according to a set of predefined criteria.

6. Feature Extraction   In pattern recognition and in image processing, feature extraction is the special form of dimensionality reduction. It is the method of capturing the visual content of images for indexing and retrieval. When the input data to an algorithm is too large to be processed and it is suspected to be notoriously redundant (much data but not much information) then the input data will

be transformed into a reduced representation set of features (also named feature vector). If the attributes extracted are carefully chosen, it is expected that the attributes set will extract the relevant information from the input data in order to perform the desired task using this reduced representation instead of the full size input.

Feature extraction involves simplifying the amount of resources required to describe the large set of data
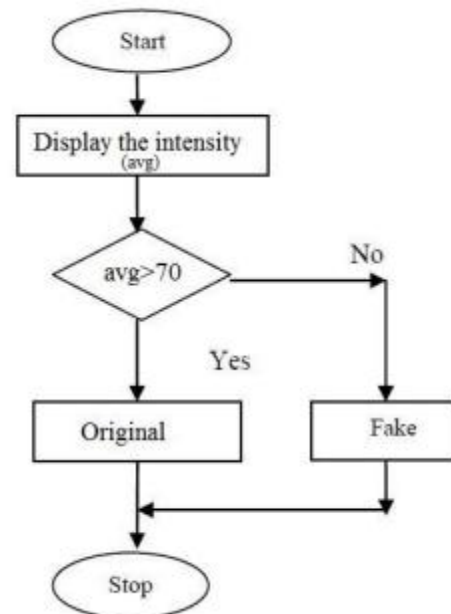
Figure 2. Flow Chart for decision making

IV. CONCLUSION

The fake currency detection using image processing was implemented on MATLAB. Features of currency note like serial number, security thread, Identification mark, Mahatma Gandhi portrait were extracted. The process starts from image acquisition to calculation of intensity of each extracted feature. The system is capable of extracting features even if the note has scribbles on it. The algorithm processed here works suitably for the newly

introduced 500 and 2000 denomination.. Hardware implementation of the proposed system can also be done using suitable processor so that to increase the speed of detection. An automatic railway ticket booking system can also be proposed which includes currency detection as one of its part. . In Future, Mobile app can be developed which would be useful for normal as well as visually impaired persons, the same system can be developed for the remaining Indian currency notes and other country's currency notes. Also the app's interface can be further modified as per the user requirements.

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Air Pollution Monitering Using Arduino and Iot

Priya Ambade[1], Shwetna Shahare[1], Fauzia Khan[1], Gunjan Mankar[1], Prof. Tirupati Goskula[2]
[1]U.G. Student, Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur
University, Nagpur, Maharashtra, India
[2]Asst. Prof. , Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur
University, Nagpur, Maharashtra, India

ABSTRACT

Air pollution is both an environmental and a social problem, as it leads to a multitude of adverse effects on human health, ecosystems and the climate. Air pollution is one of the largest Environmental health risks in Europe today. Quality of the air in city and urban areas is the most important factor that directly influences the incidence of diseases and decreases the quality of life.

Taking appropriate decisions in a timely period depends on the measurement and analysis of the parameters of the air, which creates the need for the development of real time air quality monitoring. The use of multi-parameter air quality monitoring systems makes it possible to do a detailed level analysis of major pollutants and their sources. These monitoring systems are important components in Many smart city projects for monitoring air quality and for controlling the main pollutant concentrations in urban areas. In this paper we present an approach for cost-effective measurement of relevant environmental parameters, based on a scalable sensor array with integrated ampero metric and infrared gas sensors. The device has been tested in the city and the measurement was compared with the output data of the local environmental control authority stations. The preliminary results show that this approach can be used as an economical alternative to the professional grade systems.

Keywords: Neural Network; Air Quality Monitoring; Air Pollution Forecast

I. INTRODUCTION

Any activity involving burning things/fuels and mixing substances that cause chemical reactions may release toxic gases in the process and some activities like construction, mining, transportation, etc. produce large amounts of dust which has the potential to cause air pollution. As generation of toxic gases from industries, vehicles and other sources is tremendously increasing day by day, it becomes difficult to control the hazardous gases from polluting the pure air. Air pollution not only brings serious damage to human health but also causes negative effects to natural environments. The air pollution occurs due to contamination of air with Carbon monoxide (CO), Carbon dioxide (CO2), Nitrogen dioxide (NO2), Sulfur dioxide (SO2) and many other harmful pollutants. This pollutant causes serious damage to environment. It also has hazardous effects on human health. Carbon

monoxide reduces oxygen carrying capacity of the body's organs and tissues which may lead to cardiovascular disease. Carbon monoxide causes visual impairment, reduced manual dexterity, reduced work capacity, poor learning ability.

So it becomes more and more important to monitor and control air pollution. It will become easy to control it by monitoring the concentration air pollutant parameters in air. Using laboratory analysis, conventional air automatic monitoring system has relatively complex equipment technology, large bulk, unstable operation and high cost. This system can only be installed in key monitoring locations of some key enterprises, thus system data is unavailable to predict overall pollution situation. Using empirical analysis, conventional air automatic monitoring system has high precision, but large bulk, high cost make it impossible for large-scale installation. Nowadays, air pollution is monitored by static air quality measurement stations which are highly reliable and can measure the pollutants in air to a high level of accuracy and precision using analytical instruments, such as mass spectrometers, operated by official authorities. However, extensive cost of acquiring and operating such stations limits the number of installations. To monitor air quality, wireless sensor networks (WSNs) might be a great tool, because they can automatically collect air quality data. It will also help us to keep a working staff away from danger and a high security can be achieve and it will also help the Government authorities to monitor the air pollution.

The proposed system will focus on the monitoring of air pollutants concentration with the help of combination of Internet of things with wireless sensor networks. The analysis of air quality can be done by calculating air quality index. This information will be displayed on the webpage via internet in real time. By the combination of internet of things and wireless sensor networks for purpose of air pollution monitoring it becomes easy to keep the air quality data updated in real time. Also the system is cost effective which make its installation possible in various areas. The system existing before was based on microcontroller based toxic gas detecting and alerting system and the developing system will have a complete monitoring system which is IOT based. Also the information will be directly sent to the internet from system; no need of computer for transmission purpose which reduces the cost further.

II. RESULTS AND DISCUSSION

1. SYSTEM ARCHITECTURE

In this section, we present the architecture of the implemented System named Out Sense. As shown in Figure 1, it includes several basic components: sensor nodes, wireless routers, server and end devices which are described in the following subsections.
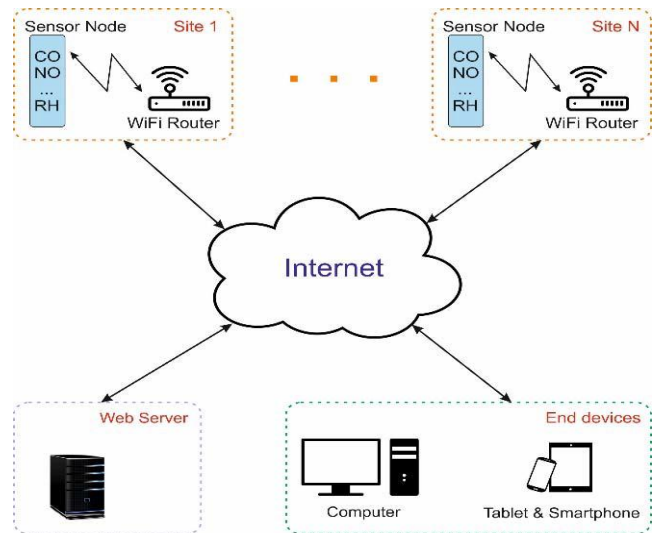

Figure 1

1.1 Sensor Nodes

The sensor nodes measure the concentration of the main air pollutants and send the acquired data to

the web server. To extend the node battery life a mechanism which alternates activity and sleep periods is used. To be more precise, each sensor node performs the following actions every 10 minutes:

1.2 Node Activation and Data Acquisition

The algorithm for node activation and data acquisition is developed using the preliminary calculations for power consumption of the microcontroller, peripheral modules and sensors. It takes into account the recommendations of the ampere metric sensors manufacturer which say that, for biased circuits, the bias voltage has to be maintained on at all the times. This does not affect the operating life of the sensors [10]. In this particular case the main consumers are the Wi-Fi module with 140 mA and the CO_2 sensor with about 40 mA and that is why while developing the node activation algorithm the time of their operation has been limited as much as possible. After a warm-up period the sensor node goes into a measuring mode. The time needed for the ampere metric sensors (O2, O3, CO2 and NO3) to go into an operating mode is around 30 seconds. The conditioning time for the other sensors (temperature, humidity and pressure) is below the 30 seconds mark. The overall warm-up time is determined by the CO_2 sensor, and it is 60 seconds later, after which the device starts measuring values. At that time all sensors and the GPS module are powered up and operating, and the mean value of the measured supply current of the node is around 135 mA. The procedure of measuring is started at the same time for all sensors. Every sensor is read when its data collection has finished or when its measurement time has elapsed. Every parameter is measured 10 times and an average of all values is taken, thus eliminating the noise. The maximum measurement time of all 10readings for all the sensors is less than 60 seconds.

1.3 Sleep Mode

Finally, the node disables the communication module(s) and enters the low-power state. The only component that remains active is the real time clock (RTC) that wakes up the Microcontroller Unit (MCU) through an interrupt after a predefined time interval (e.g. 10 min). Then, the steps for measuring and transmitting of data are performed again. After data have been gathered by the sensor nodes, they are sent to the back-end server. In this approach we have decided to use a Wi-Fi connection. Hence, the user is assumed to have a Wi-Fi access point (or router) covering the area where the sensor node is located. As an option we have provided the possibility of adding a GPRS modem.

1.4 Gas sensors

For the carbon monoxide we have used a sensor CO-AF from Alpha sense with a range of 0 to 5000 ppm, for nitrogen dioxide – NO2-A42F sensor, for ozone – OX-A421 and for oxygen – O2-A2 sensor [11]. These sensors use a programmable analog front end (AFE) LMP91000 from Texas Instruments. It provides a complete signal path solution between the sensors and the microcontroller that generates an output voltage proportional to the sensor cell current. The output voltage of AFE is measured via an external 16-bit resolution ADC placed close to the LMP91000 to reduce noise. Carbon dioxide is measured using a K30 sensor with the non-dispersive infrared principle produced by Sense Air and has an operating range of up to 5 000 ppm.

1.5 Server implementation

For the web server we have decided to use a desktop computer with open source software – for the operating system a Linux distribution – Debian, Apache for the web server and the free database

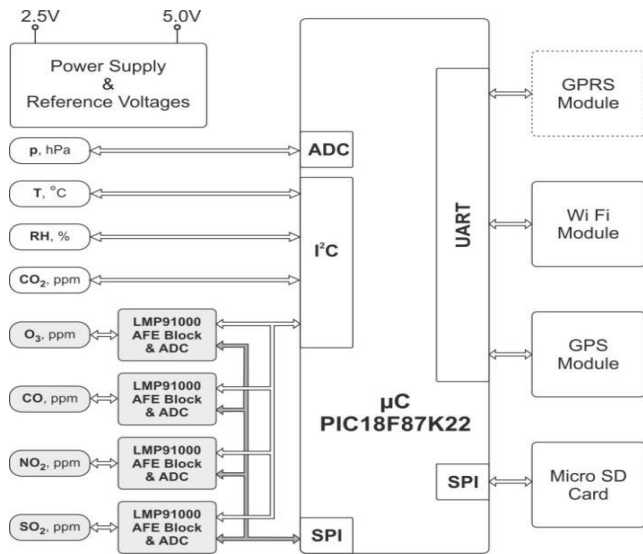MySQL. We have used Google Maps for displaying the data measured on a map.

Figure 2

III. CONCLUSION

In this study we present the preliminary results about the quality of the data obtained by low cost sensors and compare them with the results reported by the official authority stations. Out Sense has been tested through an in-situ experiment, in different urban areas. The experimental measurements compared with the values provided by the local environmental control authorities show that the measurements obtained from low-cost sensors are not as accurate as official data but they can provide useful indications of air quality in a specific location. The data quality provided by the sensor nodes depends significantly on the accuracy of the used low cost sensors. In our approach a scalable sensor array with integrated ampere metric and infrared gas sensors has been selected for this implementation. The Combination of ampere metric gas sensors for pollutant and oxygen measurement with sensors for precise measurement of basic physical parameters, such as Atmospheric pressure, temperature and humidity make it possible to perform higher precision measurements of gas concentrations. The precision achieved after the so called collocation calibration is comparable with the precision after calibration in laboratory conditions, which entails higher costs (in terms of materials and time) and that has been proven by other studies too [14, 15]. The co-location calibration can be considered as a valuable tool in the next generation of mobile air quality monitoring. This is what makes the present approach an interesting alternative for calibration of sensors to measure air parameters and will thus be the subject of our future studies. In this study we did not examine the long-term performance response characteristics (e.g., drift of signal over extended time periods, stability of response depending on sensor lifetime etc.). We envisage to make extended measurements and design a calibration model, which will take into consideration not only the changes in temperature, humidity and atmospheric pressure, but also the corrections for the temporal drift.

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"A Coin to Cash Converter Machine"

Prof. Mohammad Amin Sultan[1], Prof. Hina Malik[2], Prof. M. Nasiruddin[3], Prof. Tariquzzaman[1]
[1]Department of Electronics & Telecommunication Engineering, ACET, Nagpur, Maharashtra, India
[2]Department of Electronics & Telecommunication Engineering, SRMCEW, Nagpur, Maharashtra, India
[3]HOD, Department of Electronics & Telecommunication Engineering, ACET, Nagpur, Maharashtra, India

ABSTRACT

In today's world human beings are going to use easiest way to fulfil any kind of their requirements. In this paper we are going to propose a machine which can convert the coins into cash. To carry the coins for a big amount, is very difficult, children always save their money in the form of coins, but to carry it for purchasing anything is so difficult. So, the easiest way is, convert these coins into CASH and carry it inside the pocket safely. To buy any thing from market and to pay the bill at any place Cash payment is very easy. The Coin Counter will count the coins and dispatch the amount in the form of Cash (Paper Currency).

Keywords: coin, cash, coin counter

I. INTRODUCTION

Now a day's people are working with machines every time, everywhere. These machines are providing easiness to human being, reducing time, providing safety, calculating fast, transferring the secret data with security, making the brain more active and competent, solving the problems and challenges. In this paper we are going to propose the coin to cash converter machine. It is the best example of mechatronics technology, it uses the knowledge of Mechanical and Electronics Engineering. This machine can be used to convert a large amount of coin into Cash. For this we need a coin counter machine which counts the coin inserted inside it. The coin counter machine made up of a counter, a display unit, a motor, sensors, microcontroller etc. interfaced with cash dispatching machine which gives the amount in the form of notes denominations.

We are dividing this system into 2 different parts. One part is for electronics requirements and interfacing and another part is for mechanical machine making. The programming of microcontroller, sensors connectivity, Counter, LCD display of count, switching of machine ON and OFF, Keyboard interfacing etc. are the requirements which will be completed in electronics part. Motor controlling, cash counting and cash dispatching is completed by mechanical system.

Block Diagram
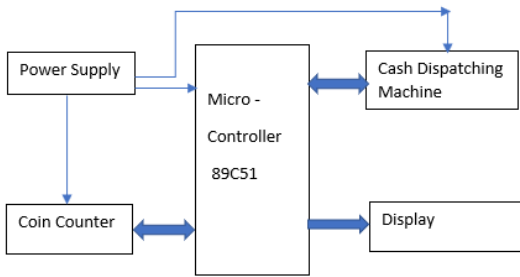
Figure 1. Block Diagram of Coin to Cash Converter Machine

The Block Diagram of Coin to Cash converter machine is shown above. It is having 1 microcontroller 89C51 block for processing and controlling the machine as per the programming. A block of Cash Dispatching machine to dispatch the cash amount by taking command from the microcontroller. Power supply section is there to supply required power to all the units. A coin counter machine is there interfaced with microcontroller to count the coins inserted inside it and give result to microcontroller. The result will be displayed on the display unit. Now let us see the working of each block.

1. Power Supply:

The Power Supply unit is the basic need of this mechanism. To fulfil this need we required 230 V, 50 Hz power supply connected to Cash Dispatching & Coin Counter machines. Microcontroller and one Seven Segment display need 5 V DC supply for which we need one AC to DC power converter. Block diagram of AC to DC Power Supply is given below.
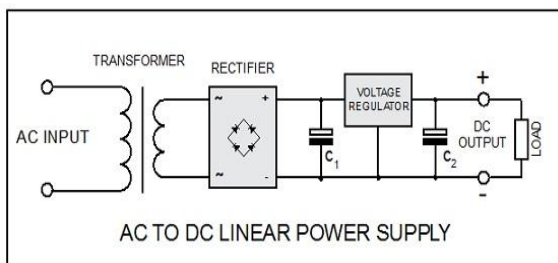
Figure 2. AC to DC Power Supply

For Cash Dispatching and Coin Counter Machines, we can directly connect to the Mains i.e. 230 V, 50 Hz Power Supply.

2. Coin Counter:

A coin counter machine is the combination of hardware and software technologies. To design it we need one tray on which we can pour the coins for counting. Below this tray we have one motor connected with inclined disc, which has some holes. These holes having specific diameter so that the coin of the size of those diameters can be inserted in to the chamber of coin counter machine. If we are making the coin counter machine for INDIA then we can have the sizes of holes for 1, 2, 5 and 10-rupee coins diameter. These holes are connected with infrared light sensor which senses the incoming of the coin through specific hole. The thickness of the coin cuts the infrared light for specific time, which clears, whether the incoming coin is one or two connected with each other. The disc which is connected to the motor and inclined, rotate continuously and the coins will get inserted through it continuously. Now the timing diagram will give the count of coins and this count will be shown on the seven-segment display unit. Here the timing diagram microcontroller and counter works together to display the count. The chamber stores the coin. The outline for coin counter machine is as shown in fig. 3. Below.
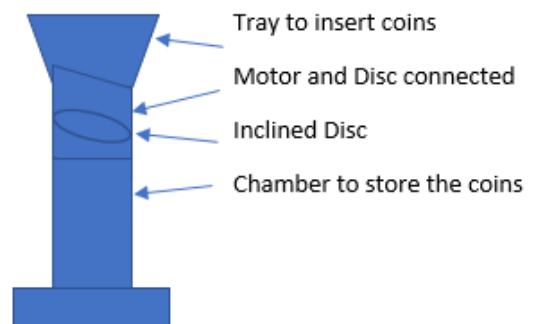
Figure 3. Outline for Coin Counter machine

3. Cash Dispatching Machine:

The Cash Dispatching Machine will work like ATM (Automated Teller Machine). In which the machine can dispatch the amount in the form of NOTES. This machine is connected to the microcontroller to take the command from it. The amount counted by the coin counter machine will be displayed on the display unit through microcontroller. This data will be stored in microcontroller and then given to the Cash Dispatching Machine. The Cash Dispatching Machine then read this data and conclude the result that how much amount has to be dispatched through it. Now the user will press the green button which will be the acknowledgement to the microcontroller to give the amount in the form of cash. The Cash Dispatching Machine will dispatch the amount through it and the user will collect it. Here the user can cancel the dispatching of cash if he will not be ready to take that amount, to round up the amount he or she can insert more coins inside the tray, then the count will get increased and the user can take the notes in the replacement of coins.

4. Microcontroller:

The Microcontroller 89C51 is the controller working on 8-bit data and having 4 I/O ports connected to it. Having 128-byte RAM & 4KB flash programable and erasable read only memory, and requires 5V DC power to work. The Microcontroller 89C51 controls all the activity happening in this proposal. It is connected to the Coin Counter Machine, the Cash Dispatching Machine and the Seven Segment Display too. The arithmetic and logical operations will be executed in the Microcontroller 89C51. The programming will be done for these controlling and dumped in it for step wise execution. Firstly, the coin counter will count the coins and give the signal to the microcontroller, then the microcontroller read this signal and display it on the seven-segment display,

then the user will allow to insert more coins if he or she wants to increase and round up the amount. Once again, the coin counter gives the result of count to microcontroller and it will display the count on the display unit. The memory present inside the microcontroller will store the data of the counting. Now when the user will give the acknowledgement to dispatch the cash the microcontroller will give the signal to the cash dispatching machine to dispatch the amount in the form of notes and the user will collect it.

The block diagram of microcontroller 89C51 is as shown in figure 4. bellow
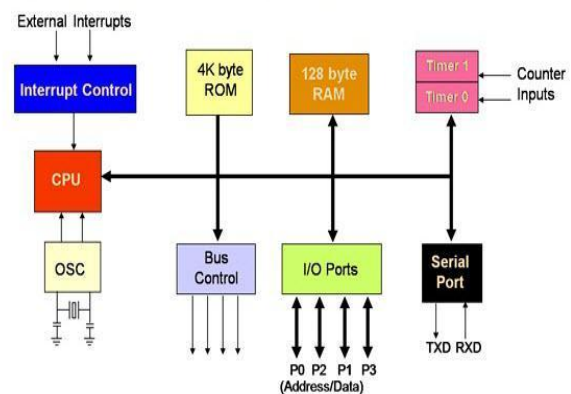
Figure 4. Block Diagram of Microcontroller 89C51

5. Seven Segment Display:

The LCD 16 X 2 Display is used to display the counting result of the Coin Counter Machine. It is also interfaced with microcontroller 89C51. It is more preferable that 7 segment displays and LED display. It can display 16 characters per line, and it has 2 such lines. It also requires 5 V DC supply for working. The pin diagram of LCD Display is as shown in fig. 5. The interfacing of LCD Display is as shown in fig. 6. ahead. Here we have connected 1 LCD Display with Microcontroller 89C51.

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Figure 5. LCD Display
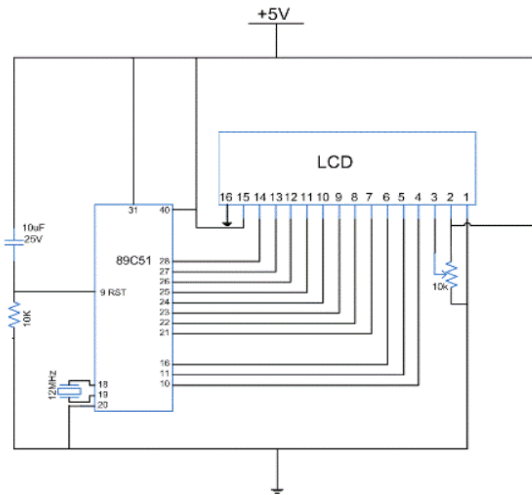
Figure 6. Interfacing of Microcontroller 89C51 with LCD Display

Future Scope:

1. We can interface one DD Dispatching Machine for the easiness to students taking admissions in various institutes.
2. We can convert the Cash in Coins too, which is the requirement of the shopkeepers.
3. In future we can assemble all the machines together so that compatibility and space requirement will be fulfilled.

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IOT Based Health Monitoring System

Pranay Gajbhiye¹, Sanket Baghel¹, Jovita Bonifas¹, Sofiya Mane¹, Akbar Ali²

¹U.G. Student, Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur
University, Nagpur, Maharashtra, India

²Asst. Prof. , Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj
Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

As we all know that in our day to day life health is playing an important role, so it is important to keep oneself fit and one should know about the fitness level of how fit the person Our project aim is that to tell the people about the fitness level of a person..Our project name is IOT Based Health Monitoring System as the name gives us the idea that we are using a software named IOT(Internet Of Things) which is very popular and has been widely used.Here we are using 8051 microcontroller which is the heart of our project, Infrared Red Device (IRD), LCD display, Power Supply, Voltage Regulator, Array Switch.Our project will detect the heart rate, body temperature of the person according to their age.This project describes the design of a simple, low-cost controller based patient health monitoring system. Heart rate of the subject is measured from the thumb finger using IRD (Infra Red) and displayed on a 16 X 2 LCD display). This instrument employs a simple Opto electronic sensor, conveniently strapped on the finger, to give continuous indication of the pulse digits. The Pulse monitor works both on battery or mains supply. It is ideal for continuous monitoring in operation theatres, I.C.units, biomedical/human engineering studies and sports medicine. This project uses 8051 MCU as its controller. By reading all the values of temperature and heart rate will be displayed on PC/Phone.This project uses 8051 Microcontroller as heart of the project. We are using switch array to select the age of human being. It starts from children to elders. project uses regulated 5V, 750mA power supply. 7805 three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12V step down transformer. Temperature, Heart beat, will be displayed on the LCD display which is connected to the Microcontroller.

Keywords: Security, FPGA, Video Surveillance, PIR Sensor

I. INTRODUCTION

Recent report says chronic diseases are the leading cause of deaths in India. People who have suffered from chronic diseases are monitored their vital signs continuously. Vital signs include the measurement of temperature, pulse rate, blood pressure and blood oxygen saturation. It provides information about a patient's state of health. They can identify the existence of any medical problem, illness and person's body physiological stress. In hospitals both in ICU ward and general ward nurses

take care of chronic disease patients. In home also, we can monitor vital signs of a patients with the help of nurses. They cannot go to hospital regularly and also hospitalization cost also increases. In hospital, the nurse's ratio is low compared to patients. For checking the vital signs data to be healthy or unhealthy, we need nurse or doctor advice and again cost is increased. In healthcare, able to collect patient data over long time that can be used to help enable preventive care.IOT related healthcare systems are based on the Internet of Things as a network of devices that connect directly with each other to capture andshare vital data through a wirelesscommunication and store the data in server. And also it provide facility to access the information through our mobile phone using Bluetooth. IOT systems are making to reduce costs and improve health by increasing the availability and quality of care.

II. IMPLEMENTATION OF HEALTH MONITORING SYSTEM
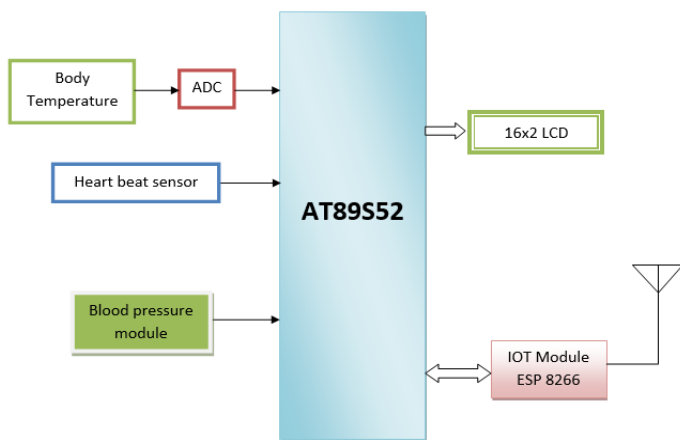
Figure 1

Chronic Disease monitoring system captured vital signs data via medical sensors, data mining algorithms to analyze the data and medical professionals can wirelessly access the information and make diagnoses and treatment recommendations based on the data. These

applications generate huge amount of data. This vital data from the sensor is mined through data mining techniques and from this model patient automatically know the vital signs data be healthy or unhealthy.

III. OBJECTIVE

1. This project describes the design of a simple, low-cost controller based patient health monitoringsystem. Heart rate of the subject is measured from the thumb finger using IRD (Infra Red Device sensors and the rate is then averaged and displayed on a 16 X 2 LCD display).
2. This instrument emmploys a simple Opto electronic sensor, conveniently strapped on the finger, to give continuous indication of the pulse digits.
3. This project uses 8051 MCU as its controller. By reading all the values of temperatureand heart rate will be displayed on PC/Phone.
4. Reduce cost of health monitoring system which are previously available for people.

IV. EMMBEDED SYSTEM

A.μc 8051 INTERNAL RCHITECTURE
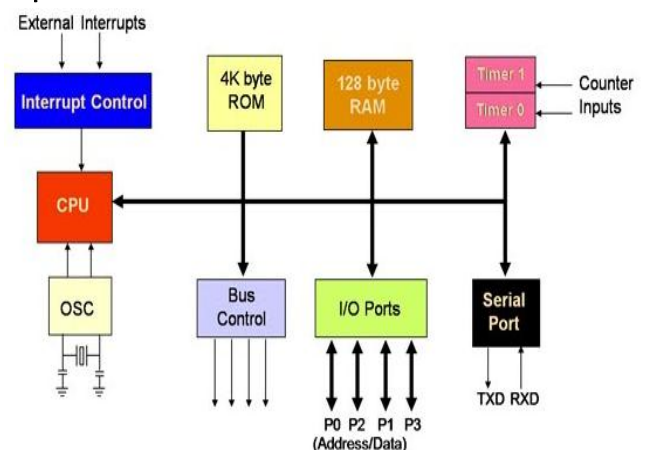
Figure 2

An embedded system is a system which is going to do a predefined specified task is the embedded system and is even defined as combination of both software and hardware. A general-purpose definition of embedded systems is that they are devices used to control, monitor or assist the operation of equipment, machinery or plant. "Embedded" reflects the fact that they are an integral part of the system. At the other extreme a general-purpose computer may be used to control the operation of a large complex processing plant, and its presence will be obvious. All embedded systems are including computers or microprocessors. Some of these computers are however very simple systems as compared with a personal computer.The Intel 8051 is an 8-bit microcontroller which means that most available operations are limited to 8 bits. There are 3 basic "sizes" of the 8051: Short, Standard, and Extended. The Short and Standard chips are often available in DIP (dual in-line package) form, but the Extended 8051 models often have a different form factor, and are not "drop-in compatible".All these things are called 8051 because they can all be programmed using 8051 assembly language, and they all share certain features (although the different models all have their own special features).

B. SOFTWARE DESCRIPTION

Java ,Python, processing are used on the pc to run communications with the arduino, they are not languages for the arduino. One limitation for them is that they do not run on the arduino. So we stick with the C++ derived Arduino language(or we can use raw C/C++). It is ideally suited to microcontrollers .

EXAMPLE:-

```
include<LiquidCrystal.h>`
LiquidCrystal lcd(12,11,5,4,3,2);
const int sensor=A1; // Assigning analog pin A1 to variable 'sensor'
float tempc; // Variable to store temperature in degree Celsius
float tempf; // Variable to store temperature in Fahreinheit
float vout; // Temporary variable to hold sensor reading
void setup()
{
pinMode(sensor, INPUT); // Configuring pin A1 as input
    Serial.begin(9600);
    lcd.begin(16,2);
    delay(500);
}
Void loop()
{
    vout=analogRead(sensor);
    vout=(vout*500)/1023;
    temp=vout; // storing value in Degree Celsius
    tempf=(vout*1.8)+32;    //converting to Fahrenheit
    lcd.setCursor(0,0);
    lcd.print("in Degree = ');
    lcd.print(tempc);
    lcd.setCursor(0,1);
    lcd.print("in Fahrenheit= ");
```

lcd.print(tempf);

delay(1000); // Delay of 1 second

I. TEMPERATURE SENSOR
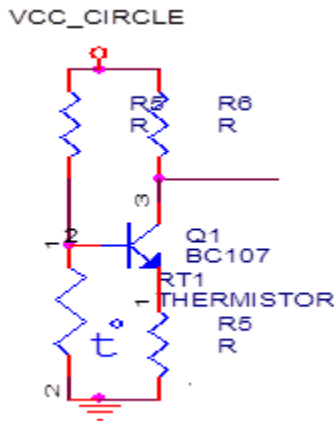
Figure 3

Temperature Sensor which converts temperature value into electrical signals. Weused IC called LM 35 astemperature sensor. LM35 series sensors are precisionintegrated-circuit temperature sensors whose output voltage is linearly proportionalto the Celsius temperature. The LM35 requires no external calibration since it isinternally calibrated. . The LM35 does not require any external calibration ortrimming to provide typical accuracies of ±1⁄4°C at room temperature and ±3⁄4°Cover a full –55 to +150°C temperature range.The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and minus supplies. As it draws only 60 µAfrom its supply, it has very low self-heating, less than 0.1°C in still air.

II. HEARTBEAT SENSOR(BLOOD PRESSURE)
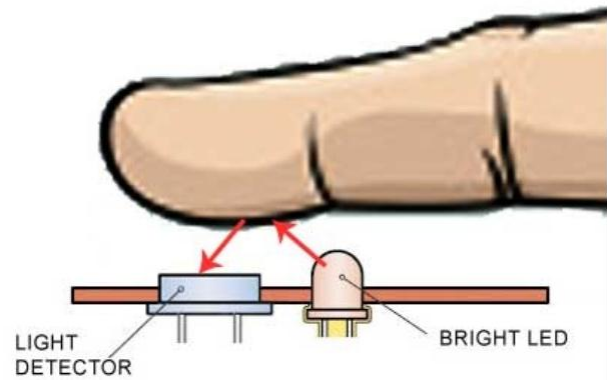
Figure 4

The active sensor in this unit is a Honeywell SSC Series pressure transducer. The sensor produces an output voltage that varies with the pressure measured in the cuff. It includes special circuitry to minimize errors caused by changes in temperature. We also provide a filtering circuit that conditions the signal from the pressure transducer. The output voltage from the Blood Pressure Sensor is linear with respect to pressure.The following is a partial list of activities and experiments that can be performed using this sensor.

1.Measure blood pressure before and after exercise. Measure blood pressure while sitting or standing.
2.Compare blood pressure after voluntary isometric contractions (weight lifting) and a rhythmic activity such as running or biking.
3.Investigate howdigestion affects blood pressure. Study the effect of caffeine on blood pressure.

ECG (AD8232 Sensor)
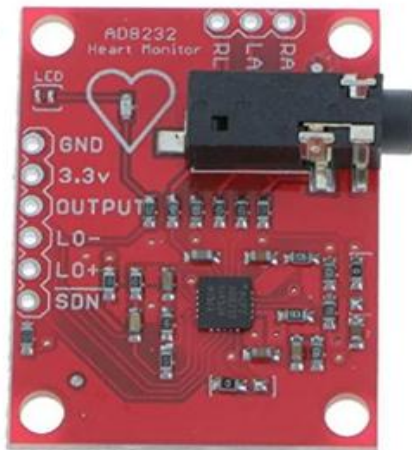
Figure 5

Figure 6

The AD8232 is an integrated signal conditioning block for ECG and other biopotential measurement applications. It is designed to extract, amplify, and filter small biopotential signals in the presence of noisy conditions, such as those created by motion or remote electrode placement.

The AD8232 module breaks out nine connections from the IC that you can solder pins, wires, or other connectors to. SDN, LO+, LO-, OUTPUT, 3.3V, GND provide essential pins for operating this monitor with an Arduino or other development board. Also provided on this board are RA (Right Arm), LA (Left Arm), and RL (Right Leg) pins to

attach and use your own custom sensors. Additionally, there is an LED indicator light that will pulsate to the rhythm of a heart beat.

V. CONCLUSSION

In this paper, we have monitored the inpatient and outpatient vital signs using Healthcare sensor and wireless technologies. We have trained a model and the model is learned by supervised learning. Meta data is also maintained for finding the health condition of patients. The model returned the status for the given vital signs, the status will be either healthy or not. In future, data processing through cloud computing and remote access to store the data will improves the computing performance. Also the Healthcare sensors will produce enormous amount of data. So we move onto Big Data techniques. Map reduce algorithm can be used to find the health status.

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Review Paper on Unsupervised Change Detection Algorithm from VHR Satellite Images using Soft Computing Technique

Asst Prof. Rahil Khan[1], Abu Huzaifa[2], Ziya Sheikh[2], Sugat Deve[2], Sameena Afroz[2]

[1]Asst Prof.,Electronics and Telecommunication Department,RTMNU/Anjuman College of Engineering,Tech, Nagpur, Maharashtra, India

[2]Student, Electronics and Telecommunication Department,RTMNU/Anjuman College of Engineering,Tech, Nagpur, Maharashtra, India

ABSTRACT

The change detection algorithms, based on remotely sensed satellite imagery, can be applied to various applications, such as the hazard/disaster analysis and the land monitoring. However, unchanged areas sometimes detected as the changed areas due to various errors in relief displacements and noise pixels, included in the original multi-temporal dataset at the application of unsupervised change detection algorithm To determine the areas that have and don't have changes, the image is grouped as two parts by Fuzzy C-Means Clustering method. For achieving these processes, firstly the process of image to image registration is completed. As a result of this, the images are being referred to each other. After that, gray scale difference image obtained is partitioned into 3x3 non overlapping blocks. With the method of principal component analysis, eigenvector space is gained and from here, principal components are reached. Finally, feature vector space consisting principal component is partitioned into two clusters using Fuzzy C-Means Clustering and after that change detection process has been done.

Keywords: Remote sensing, Change detection, Multi-temporal images, K-means clustering, Fuzzy c-means clustering, VHR Image.

I. INTRODUCTION

In remote sensing, change detection aims to identify changes occurred on the Eart surface by analysing multitemporal images acquired on the same geographical area at different times (Coppin et al. 2004, Lu et al. 2004, Radke et al. 2005, Bruzzone and Bovolo 2013). Over the past few years, many change detection methods have been imposed for various remotely sensed data. Generally, these methods can be grouped into supervised (post-classification) and unsupervised types (Bruzzone and Prieto 2000,Yetgin 2012). Though the supervised change detection methods supply the land-cover transformation, unsupervised change detection methods are more widely used and researched, thanks to the limitations of classification accuracy and ground reference absence (Bruzzone and Prieto 2000, Bovolo et al. 2008). In this paper, we focus on the unsupervised change detection. Unsupervised change detection could be seen as a clustering process to partition

pixels into changed and unchanged parts using some methods, such as image differencing, image ratio, image regression, and change vector analysis (CVA), etc. (Yetgin 2012, Shi and Hao 2013).Oneof the most widely used change techniques is to analyse the difference image created by subtracting corresponding bands of the multitemporal images pixel by pixel. Some literatures proposed automatic analysis for the difference image instead of an empirical threshold to identify changes (Huang and Wang 1995, Bruzzone and Prieto 2000, Baziet al. 2005, Imet al. 2008).

In this paper, a novel change detection approach is proposed using FCM and K-MEANS to address, for example, the absence of detailed information of traditional K-MEANS and the value overlap of changed and unchanged pixels in the difference image of FMC. As shown in figure 1, the proposed approach is made up of three blocks as follows. First, the difference image is generated using CVA method based on multitemporal remotely sensed images. Then FCM is performed to the difference image, so the initial change map and the cluster membership probability of pixels belonging to changed and unchanged parts are obtained. Finally, the membership probability is introduced into KMEANS using the spatial attraction model to control the boundary pixels in this process and the change map is produced.

II. METHODS AND MATERIAL

Unsupervised change detection techniques mainly use the automatic analysis of change data which are constructed using multitemporal images. The change data are generally created using one of the following: 1) image differencing; 2) normalized difference vegetation index; 3) change vector analysis; 4) principal component analysis (PCA); and 5) image rationing
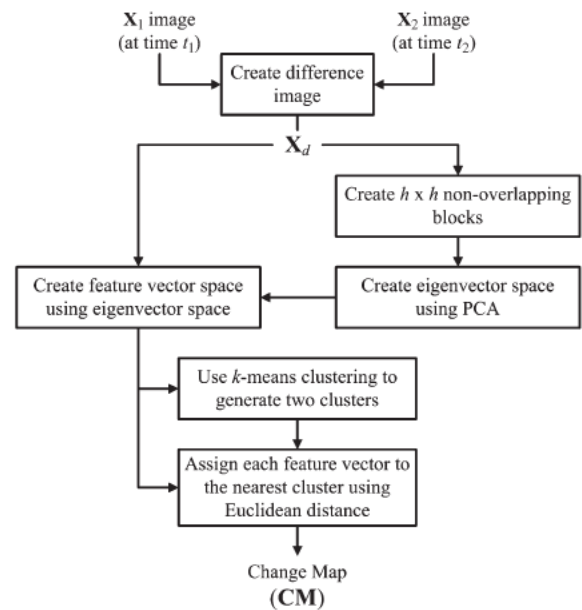
Figure 1

Simple Differencing In this technique, spatially registered images of time I, and 1, are subtracted, pixel by pixel, to produce a further image which represents the change between the two times. Mathematically,

$$Dx_{ij}^{k}(t_2) = x_{ij}^{k}(t_2) - x_{ij}^{k}(t_1) + C$$

Where =pixel value for band k and i and j are line and pixel numbers in the image, t1, =first date, t2r, =second date and C=a constant to produce positive digital numbers. The input data can be comprised of raw images or spatially filtered ones. Procedure yields a difference distribution for each band.

Image Ratioing

Ratioing is considered to be a relatively rapid means of identifying areas of change (Howarth and Wickware 1981, Howarth and Boasson 1983, Nelson 1983, Todd 1977, Wilson et al. 1976). In ratioing two registered images from different dates with one or more bands in an image are ratioed, band by band. The data are compared on a pixel by

pixel basis. One computes Where , is the pixel value of band k for pixel x at row i and column j at time t2. If the intensity of reflected energy is nearly the same in each image then , this indicates no change.
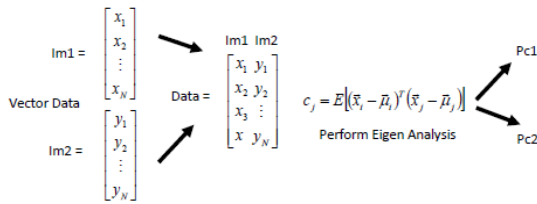
Figure 2

Principal Components Analysis (PCA) Figure.2.
PCA algorithm for change detection Principal Component Analysis is a linear transformation technique and probably the most common of these techniques. The main principal of the PCA approach is to use as input a set of images and to reorganize them via a linear transformation, such that the output images are linearly independent. The new coordinate system for the data is projected such that the greatest variance lies on the first axis or the first principal component and the second greatest variance on the second axis. This technique is usually used to reduce the number of spectral bands or in compression schemes. In CD studies, the consequence of this linearization is that unchanged pixels or common information shared by a pair of images are 21 expected to lie in a narrow elongated cluster along a principal axis equivalent to the first component (PC1)

K-means Clustering

The K-means clustering is a simple clustering method which uses iterative technique to partition n observation into k clusters. The partition of n observation into k clusters is based on the nearest mean principle. Even though it is fast and simple in execution, the clustering will not converge if the selection of initial cluster center is not made

properly. Kmeans algorithm is an unsupervised clustering algorithm that classifies the input data points into multiple classes based on their inherent distance from each other. The algorithm assumes that the data features form a vector space and tries to find natural clustering in them. [Dalmiya et.al, 2012]. The basic k- means clustering algorithm is as follows: Step 1: Choose k = # of clusters. Step 2: Pick k data points randomly from the dataset. These data points act as the initial cluster centers Step 3: Assign each data point from the n observation into a cluster with the minimum distance between the data point and cluster centre. Step 4: Re-compute the cluster centre by averaging all of the data points in the cluster. Step 5: Repeat step 3 and step 4 until there is no change in cluster centers Therefore K-means clustering, the key endeavor is to partitions the n observation into k sets (k<n)s={s1,s2,s3,....sk} so as to minimize the within cluster sum of squares. K arg min ∑ . ∑|| x j – ui ||2 i =1x j ∈si Where ui is the mean of points in Si, K is the number of clusters and xj is the j th data point in the observations [Ramani et.al, 2013][Gumaei et.al,2012].

III. RESULTS AND DISCUSSION

PERFORMANCE ANALYSIS FACTORS Based on the following three factors, we can analyse the performance of different fusion methods. False Alarm (FA), Missed Detection (MD), and Total Errors (TE). 1) False Alarm (FA): The numbers of the unchanged pixels in the ground truth map are detected as changed and the FA rate in percentage is described as .PF =FA/NU×100, where FA —False Alarm, NU-Ground truth map detected as changed. 2) Missed Detection (MD): the numbers of changed pixels in the ground truth map are detected as unchanged and the MD rate in percentage is described as PM=MD/NC×100, where MD-Missed detection, NC – Ground truth maps are detected as

unchanged. 3) Total Error (TE): The sum of FA and MD and the TE rate in percentage is described as PTE = (FA+MD)/(NU+NC)×100. (Biao Hou, 2014).
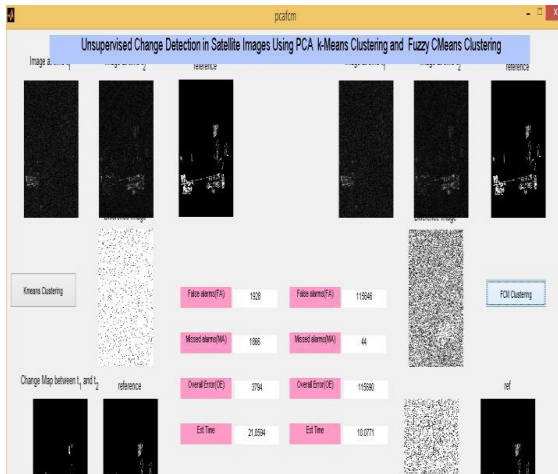

Figure 3

IV. CONCLUSION

An unsupervised change detection technique is developed by conducting fcm means clustering on feature vectors which are extracted using h × h local data projection onto eigenvector space. The eigenvector space is generated using PCA on h × h no overlapping difference image blocks. The proposed method uses h × h neighborhood to extract feature vector for each pixel so that it automatically considers the contextual information. The proposed algorithm is simple in computation yet effective in identifying meaningful changes which makes it suitable for real-time applications. It produces results comparable, even better, with the MRF-based approach [5], which requires computationally expensive data modeling and parameter estimation. Simulation results show that the proposed algorithm performs quite well on combating both the zero-mean Gaussian noise and the speckle noise, which is quite attractive for change detection in optical and SAR images
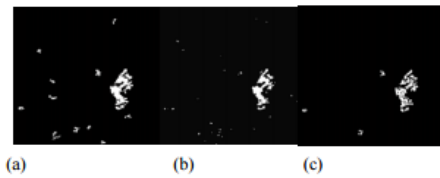
Figure 4.Change detection results obtained by using Kernel K-means clustering

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Design and Analysis of SRAM and DRAM using Microwind Software

Abhilesh Kedar, Aditya Verma, Latika Raut,Pinki Kumbhare, Rajashree Karoo, Rajeshree Zade, Prof. Omprakash K. Piprewar

Department of Electronics and Telecommunication Engineering S. B. Jain Institute of Technology, Management and Research, Nagpur, Maharashtra, India

ABSTRACT

This study analyses an minimizing the power consumption during write and stand by operation and propagation delay during write in 6T SRAM cell and 1T1C DRAM cell. And these cells are designed using Microwind3.5 Software in 45 nm and 32 nm CMOS Technology. The 6T architecture of SRAM cell is implemented using 32 nm CMOS Technology and Result have been compare with that of 45 nm CMOS Technology. Also the 1T1C architecture of DRAM cell is implemented using 32 nm CMOS Technology and Result have been compare with that of 45 nm CMOS Technology. The result of the delay and power dissipation of SRAM and DRAM with the applied power supply is presented. The graph of Voltage vs Time is plotted using Microwind3.5 software.

Keywords: SRAM, DRAM, MICROWIND, CMOS Technology

I. INTRODUCTION

In the design of many modern electronic digital design semiconductor memories plays an essential role where there is need for data storage, such as computers based application and microprocessors found in many application fields of image processing, satellite signal processing, and even consumer electronic devices. In this era CMOS technology scaling will be a main drive force of the electronics industry and also for faster and denser integration it provided a path.

As the length of channel is reduced, the performance of the transistor improves, the density improves and the power per switching event decreases. Over the last two decades, the number of components per chip and the system performance is improving exponentially. Major factors influencing the need of low power design are increasing different personal computing devices viz. wireless communicating devices; smart cards, PDA's, digital pens and audio and video based multimedia products etc.

As the SRAM cells are categorized as latch, the refresh operation is not required to keep the data during power on condition in SRAM cells. To store a single bit of data SRAM uses four transistors. The essential parameters of SRAM cells are the speed and power consumption which provides multiple

designs with the aim of degrading the power consumption during read write operations of SRAM.

DRAMs is categorized as volatile memory which means it loses their memory content when the power to the host system is turned off; but unlike DRAM, SRAM is non destructive read-out (NDRO). SRAMs consume very much less energy than DRAMs and thus is an automatic choice over the latter. SRAM doesn't require a refresh cycle because Data don't "Leak Away".

All the simulations are done with the help of Digital Schematic (DSCH) editor and the Microwind3.5 software. Microwind is a tool for designing and simulating circuits at layout level. The tool features full editing facilities (copy, cut, past, duplicate, move), various views (MOS characteristics, 2D cross section, 3D process viewer), and an analog simulator. DSCH is a software for logic design. Based on primitives, a hierarchical circuit can be built and simulated. It also includes delay and power consumption evaluation. Schematic design simulations are performed and the functionality verifications is done with the help of DSCH software. The Verilog code is generated for these modules and is being called from Microwind software to generate a layout. A functional verification is also done with the layout output of each module. Layout diagrams, power analysis results are obtained in the result section.

II. PROPOSED DESIGN

1. 6T SRAM Cell

A SRAM is a bi-stable element used to data as voltage potential. The basic 6T SRAM cell consist of cross coupled CMOS inverters. The inverter usually have a large nMOS width as compared to the pMOS

width. This often causes switch threshold of inverter to be close to nMOS threshold voltages.

A. A SRAM cell has three different states it can be in A. Write when updating the Data.
B. Read when the data has been requested.
C. Standby where the circuit is idle.
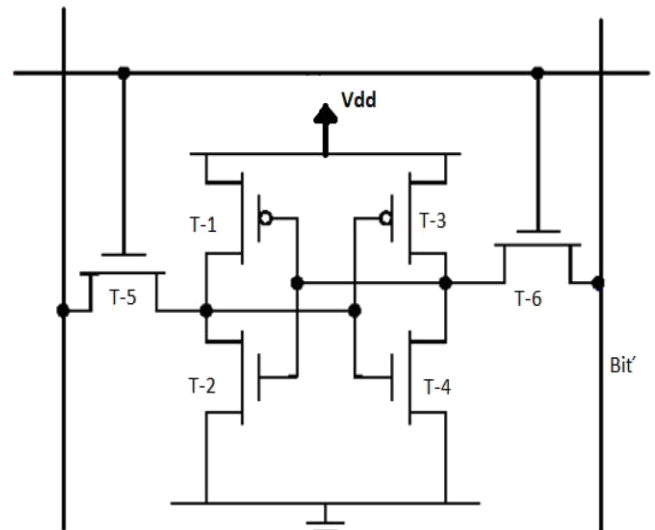
Figure 1. 6T SRAM Cell

A. WRITE OPERATION

Write operation starts with assigning the values to be written at the Bit and its complimentary value at Bit'. In order to write '1' Bit is pre-charged with high voltage and the complimentary value '0' is assigned to Bit'. When T-5 and T-6 are set in ON condition by asserting WL 'high', the values assigned at Bit get stored in the latch as Data. The T-5 and T-6 MoSTs are designed to be much stronger than the relatively weak transistors in the cell, T-1, T-2, T-3 and T-4 so that they are able to override the previous state of the cross-coupled inverters.

B. READ OPERATION

The Read Operation is started by asserting the word line 'WL' high which enables both the access

transistors T-5 and T-6 after pre-charging both the Bit and Bit' lines to a logical 1. The second step occurs when the values stored in Data and Data' are transferred to the Bit lines by leaving Bit at its pre-charged value and discharging Bit' through T-4 and T- 6 to a logical O.

C. STANDBY STATE

For the idle state, the word line (WL) is not asserted and the access MoSTs T-5 and T-6 disconnect the cross coupled inverters from the bit lines. The two cross coupled inverters INVI and INV2 formed by T-l, T-3 and T-2, T-4 they are not connected from any external circuits.

2. 1T1C DRAM Cell

A DRAM is the main memory used for all desktop and larger computers. DRAM cell is made up of a single MOS transistor and a storage capacitor. Each storage cell contains one bit of information. This charge, however, leaks off the capacitor due to the sub-threshold current of the cell transistor. Therefore, the charge must be refreshed several times each second.
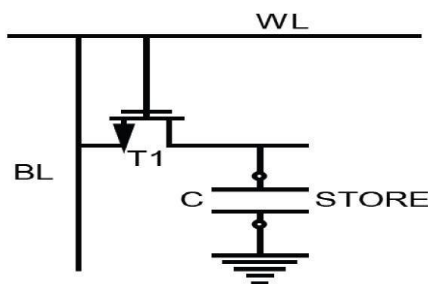
Figure 2. 1T1C DRAM Cell

The write operation can be done by placing a "1" or "0" charge into the capacitor cell. This is done by opening the cell transistor (gate to Vdd) and presenting either Vdd or ground at the capacitor. The word line is then held at ground to isolate the capacitor charge. This capacitor will be accessed for either a new write, a read, or a refresh.

III. IMPLEMENTATION USING MICROWIND

MICROWIND is integrated EDA software encompassing IC designs from concept to completion, enables chip designers to design beyond their imagination. MICROWIND integrates traditionally separated back-end and front-end chip design into an integrated flow, accelerating the design cycle and reduced design complexities.

The 45 nm technology invented in 2007 & it has effective Gate length of 30 nm whereas The 32 nm technology invented in 2009 & it has effective Gate length of 25 nm. Compared to 45 nm technology, the 32 nm technology offers 30% increase in switching performance, 30% less power consumption, double higher density, two time reduction of the leakage between source and drain and through the gate oxide. At each lithography scaling, the linear dimensions are approximately reduced by a factor of 0.7, and the areas are reduced by factor of 2. Smaller cell sizes lead to higher integration density which has risen to nearly 1.5 million & 2.8 million gates per mm2 in 45 nm & 32 nm technology respectively.

IV. SIMULATION RESULT

1. 6T SRAM Cell

The circuit diagram for 6T SRAM Cell is shown in figure 3 which is implemented by using DSCH editor.
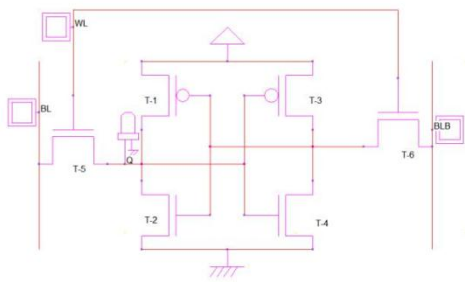
Figure 3. 6T SRAM Cell using DSCH editor

In figure 3 it is shown that SRAM cell uses two inputs lines namely WL (write line) and BL (bit line). Write line acts like an enable pin which is connected to gates of the transistors T-5 and T-6. BL represents the bit that needs to be stored and BLB its complement. To perform write operation, we need to keep the BL in the required state by keeping the WL pin in low state and then change the state of WL pin to high. The two inverter circuits connected to each other are responsible for holding the data. To perform read operation, we need to make BL and BLB high. After this, either of the BL and BLB lines will be pulled low because it gets discharged due to the zero state present on one of the inverters. Figure 4 shows the timing diagram for function verification.

Figure 4. Timing diagram of 6T SRAM Cell

The layout of 6T SRAM Cell using Microwind3.5 is shown in figure 5.

Figure 5. Layout of 6T SRAM Cell

2. 1T1C DRAM Cell

The circuit diagram for 1T1C DRAM Cell is shown in figure 6 which is implemented by using DSCH editor.
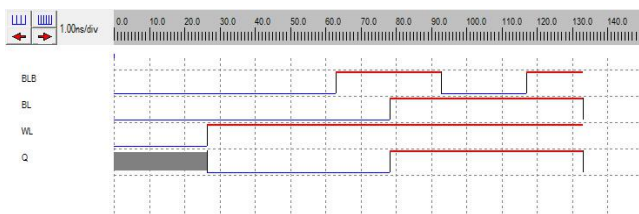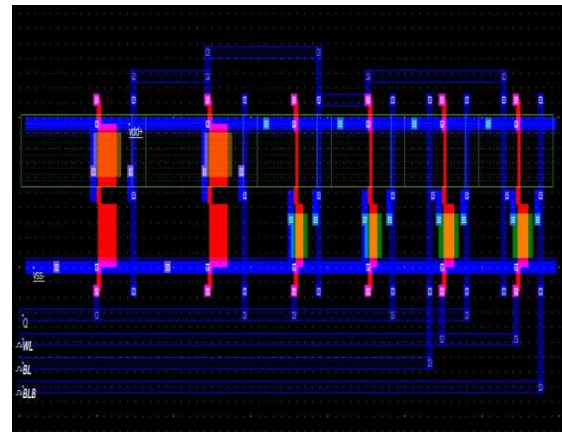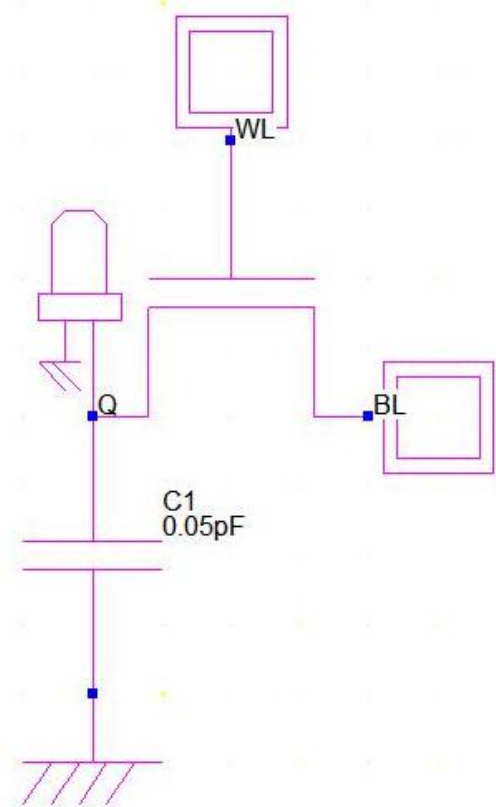

Figure 6. 1T1C DRAM Cell using DSCH editor

In figure 6 it is shown that DRAM cell uses two inputs lines namely WL (write line) and BL (bit line).In DRAM also write line acts like an enable pin which is connected to gate of the transistor. BL represents the bit that needs to be stored. To perform write operation, we need to keep the BL in the required state by keeping the WL pin in low state and then change the state of WL pin to high. The nMOS transistor acts like flip-flop to store the data. To perform read operation, we need to make BL high. Figure 7 shows the timing diagram for function verification.
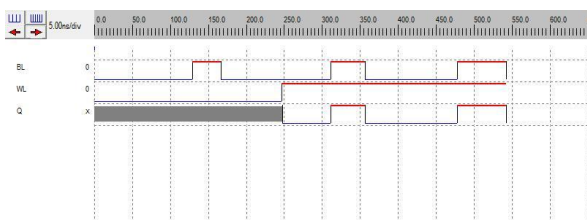
Figure 7. Timing diagram of 1T1C DRAM Cell

The layout of 1T1C DRAM Cell using Microwind3.5 is shown in figure 8.
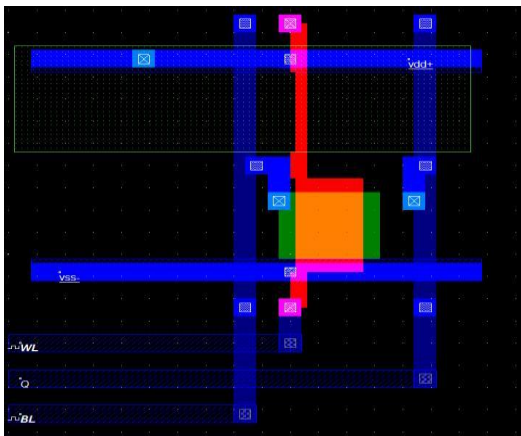
Figure 8. Layout of 1T1C DRAM Cell

Table 1. Comparitive Analysis Of Sram And Dram

Sr. no.	Contents		
	Parameters	**SRAM**	**DRA M**
	Pre-charged	0.12ns	0.15ns
1	Delay Read	0.24ns	0.4ns
	Write	0.30ns	0.37ns
2	Power Consumption	0.185m W	0.20mW
3	Area Required	2375um^2	3580um^2

V. CONCLUSION

From this Paper After doing Design and Analysis we have found the comparative Evaluation between different parameters of SRAM and DRAM cell at 45 nm and 32 nm it has shown that the SRAM cell has better performance as compare to DRAM cell. To have better result our future work will concern with 22-nm Technology.

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Ergonomic E- Bike

Aniket Rajeyya[1], Dhanshri Dhoke[1], Mangala Shende[1], Najiya Sayyad[1], Neha Satpute[1], Prajwal Band[1], Saif Khan[1], Prof. Mohd. Safique Memon[2]

[1]Student Anjuman College Of Engineering and Technology, Nagpur, Maharashtra, India
[2]Professor Anjuman College Of Engineering and Technology, Nagpur, Maharashtra, India

ABSTRACT

Bicycles have always a popular mode of transportation due to their low cost, ease of use, health benefits and mobility. Their drawbacks however include a low practical range, Increased effort compared to a car, and safety concerns in urban areas. A fully sustainable electric bike will be created which will not address a regular bicycle's drawbacks but includes features to it to make it more appealing to people that normally would not consider commutating on e-bike. This relationship allows for more practical range of the bike while assisting the user with additional torque during all phases of acceleration rather than just using a throttle control located at the handle which is similar to the normal electrical bike. A normal throttle control however will be included for when the user decides not to use this feature and rely solely on the motor for torque. An Arduino board to communicate with an application device for displaying the battery charge status, temperature and speed. There will be solar panel connected to it to charge the battery. A USB charger will also will be included in addition to "wall outlet" so that the user may charge mobile devices while using the bicycle. To address safety concerns, head lamps, tail lights, a horn, LEDs and turn signal will be included. The bike will be made from lightweight aluminum with custom design brackets. When the bike is not in use the battery which is charged by using solar power and can be used to run household applications. It also consists of solar charge controller which will control and display the parameters of solar panel mounted on the top of the bike.

Keywords: Self Charging, motor controller, voltage regulator, Arduino (LCD display), Inverter, lead acid battery, DC gear head motor (Permanent Magnet DC Motor)

I. INTRODUCTION

Now a day's world's market is full of motorcycles, mopeds and cars which are some or the other way are responsible for environmental pollution. Pollution is one of the major crises that world is facing today. Each fuel vehicle purchased has raised pollution to the dangerous level. We are also aware of the rapid increase in price of the petrol. Also, it is not possible for all the classes of the society to purchase vehicles such as mopeds, bikes, scooters etc. Bicycle is an ecofriendly vehicle and can be an option but the efforts required is more. People get tired after riding a bicycle even at short distance. People all over the world are becoming increasingly aware of the environment impact of vehicles. This Ergonomic e bike is a solution to the planet.

The ergonomic e bike is projected as an innovative and comfortable option for those who want to mobilize easily and care for the environment. This

is one of the best way to move from conventional method to renewable resource which will help to establish sustainable development. Further it is also a low-cost alternative to an automobile.

There are two sources of power in this bike .one is solar panel which will charge the battery. The power module is controlled by microprocessor (Arduino). Various parameters such as temperature, voltage, speed, battery percentage etc. will be displayed on small LCD. Which will help the rider to monitor the status of the bike. When bike will be on standby condition then the power in the battery can be used to run home appliances through inverter in emergency conditions.

E-BIKE

An electric bike also known as e-bike or booster bike with an integrated electric motor which can be used for electric propulsion. For the power source of electric motor certain country used different power because it depends on the laws of the country. It is not included in transportation law which require the certification and operation as on good motor vehicle. There is no need to have license to ride the e bike. Figure 1 shows the block diagram of ergonomic e –bike. It consists of following components (Figure 1) – DC motor, solar panel, lead acid battery, Arduino, solar charge controller, inverter, charger.

WORKING PRINCIPLE
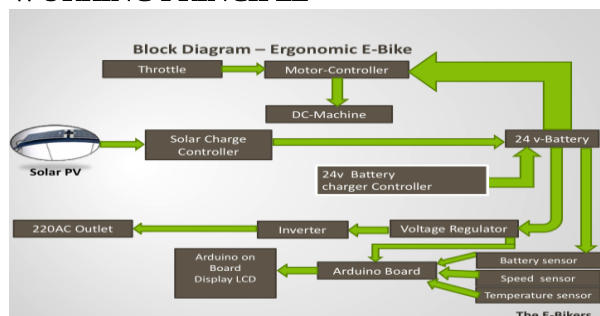
Figure 1. Block diagram of E-Bike

The above block diagram gives an overview of the working of Ergonomic e bike. Solar power is the main source of energy. Solar energy is captured by solar panel and is converted into electrical energy. Solar charge controller will manage the power going into the battery form the solar array. The electrical energy thus formed is being fed to the batteries that get charged and is to run 24 V DC motor. There will be a motor controller which will control the variance of the voltage. The shaft of the motor is connected to the rear wheel of the vehicle through chain sprocket. A small LCD will display the parameters like battery percentage, speed temperature and voltage through Arduino. It also consists of inverter which can be used to run home appliances in emergency condition.

COMPONENTS OF ERGONOMIC E-BIKE

1.DC gear head motor (Permanent Magnet DC Motor)

In our project we are using dc motor which converts direct current electrical energy into mechanical energy. It works on the principle that "whenever current carrying conductor is placed in a magnetic field it experiences a mechanical force." A dc motor's motor speed can be controlled over a wide range by varying voltage. We are using motor controller to control the speed of the motor which works on the PWM method. Dc motor provide high efficiency and reliable performance. A gear assembly has been attached to the motor. The gear assembly help in increasing the torque. With proper combination of gears desirable speed can be obtained. E- bike has front gear with 28 teeth and back gear with 18 teeth.

The Relative number of teeth between the driven sprocket & the driver sprocket determines the

Speed & Torque of the Driven shaft. Ratio of the teeth can be selected to increase or decrease speed or torque to the driven shaft

Figure 2. Chain Sprocket
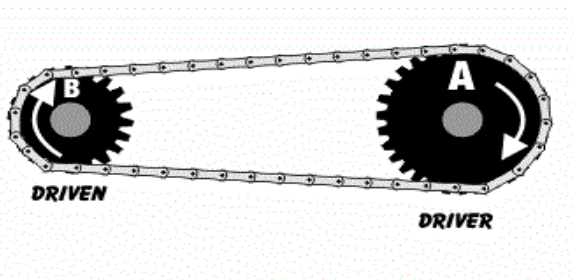
Figure 3. Chain Drive

2. SOLAR PANEL

Solar panel absorb the sunlight as a source of energy to generate electricity. Photovoltaic modules use light energy from the sun to generate electricity through the photovoltaic effect. The majority of modules use wafer based crystalline silicon cell or thin film cells. The structural member of a module can either be the top layer or the back layer. Cells must also be protected from mechanical damage and moisture. Most modules are rigid, but semi flexible ones are available, based on thin film cells. Modules electrical connection are made in series to achieve

A desired output voltage and in parallel to provide a desired current capability.

Table 1: Specifications of Solar Panel

Maximum Power (Pmax)	40 W
Voltage At Max. Power(Vmp)	17.60 V
Current At Max.Power(Imp)	02.27 A
Open Circuit Voltage (V)	21.50 A
Short Circuit Current	02.25 A
Tolerance	± 5
Lifespan	25 years
Size	46.5 cm × 66.5 cm × 3.5 cm

Figure 4. Solar panel

3. BATTERY

A lead acid battery is a secondary cell, meaning that it is rechargeable. It contains plates of lead and lead oxide in a sulfuric acid solution. The lead oxide oxidizes the lead plate, making an electrical current. Despite having a very low energy to weight ratio and a low energy to volume ratio, its ability to supply high surge currents means that the cells have a relatively large power to weight ratio. These features, along with their low cost, make them attractive for use in motor vehicle to provide high current required by automobile starter motors. It is best in terms of reliability and working capabilities

as it withstands slow, fast and overcharging. Also, its life cycle is long all this combine and make it optimum choice for E- bike

Table 2. Specifications of lead acid battery

Number of batteries	Two batteries connected in series
Voltage	24v
Ampere hour rating	24Ah
Standby battery voltage	40 volts
Charging time	7-8 hours
Weight	10 kg
Safety	Good
Cycle life (no. of cycles)	400
Operating temperature (degree)	10-60

Figure 5. Battery

See the following equations to calculate the range from amperage and voltage:

Ah (Amp hours) × V (volts) = Wh (Watt hours)

26 Ah × 24 v = 624 Wh

Motor Rating = 350 watt.

Operating Time =624Wh/350W = 1.78 Hour

4.ARDUINO MICROCONTROLLER

Arduino is an open source programmable circuit that can be integrated into a wide variety of maker space projects both simple and complex. This board contains a microcontroller which is able to be programmed to sense and control objects in the physical world. By responding to sensors and input, the Arduino is able to interact with a large array of outputs such as LEDs, motors and displays. Specifically, we are using Arduino Uno in our project. The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. In order to get started, they are simply connected to a computer with a USB cable. The chip on the board plug straight into your USB board and support on your computer as virtual serial port. The benefit of the setup is that serial communication is an extremely easy protocol which is time-tested and USB makes connection with modern computers and makes it comfortable. It had a feature of built-in voltage regulator. Parameters like battery percentage, temperature, voltage and speed are displayed on small LCD screen for the convenience of the rider.

Figure 6. Arduino LCD

Figure 7. Arduino UNO

5. MOTOR CONTROLLER

Speed controllers of DC motor are very useful for controlling the robotic motion and automation systems in industry. When the DC motor is on, it takes certain time to reach at full speed. As soon as the power source is on, the DC motor starts gaining speed and if we switch off the power source before it reaches at rated speed, it starts to goes down. In quick succession of switching on and switching off are done, the motor rotates at a lower speed between zero and rated speed. So, we are using IC 555based PWM controller.

PWM have many of the characteristics of a control system. A simple method to control the speed of a DC motor is to control driving voltage, when the voltage is high the speed would be high. In many applications normal voltage control would cause lot of power loss on control system, so PWM method is mostly used in DC motor speed control application. This method work on low frequency so lower frequency is better than higher frequency. Figure 8 shows the circuit diagram of motor controller.
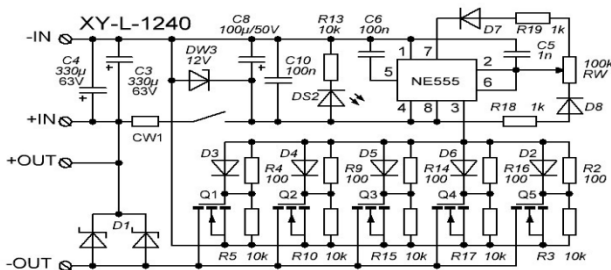
Figure 8. IC 555 based PWM controller

6. SOLAR CHARGE CONTROLLER

A solar charge controller manages the power going into the battery bank from the solar array. It ensures that the deep cycle batteries are not overcharged during the day, and that the power doesn't run backwards to the solar panels overnight

and drain the batteries. Some charge controllers are available with additional capabilities, like lighting and load control, but managing the power is its primary job. A solar charge controller is available in two different technologies, PWM and MPPT.
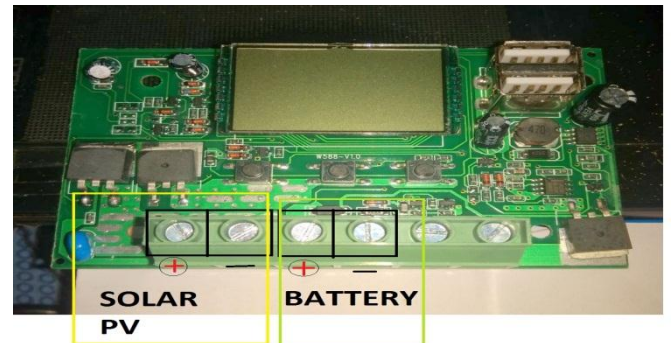
Figure 9. Solar charge controller

7.INVERTER

An inverter is an electrical power converter that changes direct current (DC) to alternating current (AC). Inverters are commonly used to supply AC power from DC sources such as batteries. They perform the opposite function of a rectifier. The electrical inverter is a high-power electronic oscillator. It is simply called DC to AC converters. The DC power source utilization will be used here in our e-bike because our battery will require 24V DC to 220V AC inverter.
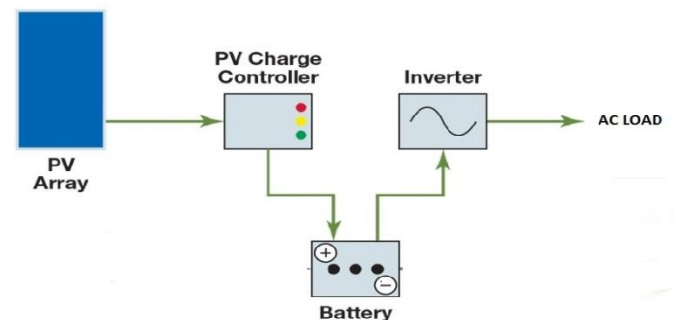
Figure 10. Inverter connections

ADVANTAGES

1. It is environment frienkmo, ;./,;dly.
2. It has long life span.

3. Low maintenance cost.

4. Noise free.

5. Run on rechargeable batteries

6. Affordable price.

7. Require less human effort.

8. Leads towards the sustainable development.

9. Non-reliable on power supply.

10. The rider will be able to see the status of the bike on LCD.

DISADVANTAGES

1. solar power is not always available.

2. Components required varies with the variation in demand of the consumer.

3. There is frictional losses.

II. RESULT and CONCLUSION

Table 3. Specifications of lead acid battery

Parameter	Ergonomic e bike	Moped	bicycle
Max. speed limit	35	45	10-15
Drivers pedaling requirement	nil	No	yes
Operating cost for 40 km. travelling in rupees.	nil	45	Nil
Weight	70	90	15
Fuel used	nil	2l	nil
Type of energy used	Solar energy	Petrol	Human effort
Noise level	no	Yes	No
License required	no	Yes	No
Helmet required	no	Yes	No

Age limit	no	Yes	No
Engine size	Not applicable	100-125cc	Not applicable
Human effort	no	No	Yes
Monitoring parameters	yes	No	No
Inverter	yes	No	no

III. CONCLUSION

Ergonomic e bike is designed considering comfort in the working environment and is driven by solar energy. It is suitable for all age groups from young to old people. It can be operated free of cost. No driving license is required to drive e-bike. It is affordable for all classes of society. Most important feature of this bike is that it does not consume fuel thereby saving money. It is ecofriendly as it does not produce any emissions. It can be recharged through adapter in case of cloudy conditions. It requires very less maintenance as compared to other vehicles. The rider is also able to check the status of the bike. Inverter is also provided so that the charged battery can be used to run the home appliances when the bike is not in use.

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Review on Data Prevention Using Honeywords

Pranav Bhagat[1], Sadia Ameen[1], Sadia Patka[2]
[1]Student, Department of Computer Science and Engineering, Anjuman College of Engineering & Technology,
Rashtrasant Tukadoji Maharaj Nagpur University, Maharashtra, India
[2]Assistant Professor, Department of Computer Science and Engineering, Anjuman College of Engineering &
Technology, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

In today's world , data security is the important for the growth of organizations and to maintain their historical and current data . These data are generally secured or protected using passwords. But what if the passwords get into wrong hands or get cracked? To solve this problem and to prevent data from unauthorized access the idea of Honeywords came into existence .The concept of "Honeywords" is to store multiple decoy passwords with the original password that the user itself has created. Whenever an unauthorized person tries to access the data using the decoy password he/she gets access to decoy files. Honeywords creates ambiguity for the adversary to get to real password and prevents password.

Keywords: Security, Password, Honeypot, Honeyword, Sweetword

I. INTRODUCTION

In this decade of Technology data security is very crucial. Data Breach can compromise the secrecy of any organisation. Also, Passwords are inheritably weak form of authentication. Password breaching has become a common thing in today's world. So to overcome this, scheme of Data Prevention i.e "Honeywords" was proposed. Honeyword concept says that for each user account, the legitimate password is stored with several honeywords in order to sense an unauthorized access to the data.

The idea of Honeywords was derived from the concept of "Honeypot". Now, honeypot is a computer system that is set up to act as a decoy to lure cyber-attackers, and to deflect, detect, or study attempts to gain unauthorized access to information systems. But honeypot introduced risk to the environment and also Finger printing was possible. So, the idea of Honeyword was brought to overcome the disadvantages of honeypot mentioned above.

If honeywords are selected by a cyber-attacker who steals a file of passwords cannot be sure if it is the real password or a honeyword for any account. Moreover, entering a honeyword to login will trigger an alarm notifying the administrator about a password file breach.

Basically, sweetwords are constructed for each legitimate username such that only one of them is the correct password and the others are

honeywords (decoy passwords). Hence, when an adversary tries to enter into the system using a honey word, an alert message or alarm is triggered to notify the administration about a password leakage occured.

II. RELATED WORK

Prof. Ronald L. & Ari Juels in their paper "Honeywords: Making Password Cracking Detectable" where they proposed a method for improving the security hashed passwords related with each user's account. The use of honeywords may be very helpful in the current environment, and is easy to implement. The fact that it works for every user account is its big advantage over the related technique of honeypot accounts [1]. But they did not prepare with data prevention as still there was probability that the adversary can get to the real password.

Imran Erguler proposed in his paper Achieving Flatness: Selecting the Honeywords from Existing User Passwords that at the expense of increasing the storage requirement by 20 times, they introduce a simple and effective solution to the detection of password file disclosure events .It suggests an alternative approach that selects the honeywords from existing user passwords in the system in order to provide realistic honeywords a perfectly flat honeyword generation method-and also to reduce storage cost of the honeyword scheme[2].

Ms. Manisha Bhole in her proposed work on Honeywords for Password Security and Management did work on Honeyword Generation method i.e chaffing-with-tweaking and made some improvements such as handling the brute force attack and social engineering attacks and introduce an enhanced model as a solutiom to an open

problem that also overcomes the previous drawbacks of honeyword generatio[3].

Prashant Muthiya & Sachin Padvi in their paper "Achieving Flatness: Selecting Honeywords From Existing User Passwords". In this system they survey the honey word system and present some remarks to highlight possible weak points at any attacker who's able to steal a copy of a password file won't know if the information it contains is real or fake. They pointed out that the strength of the honey-word system directly depends on the generation algorithm, i.e., the generator algorithm determines the chance of distinguishing the correct password out of respective sweetwords [4].

Ms. Komal Naik and Prof. Varsha Bhosale proposed the concept of honeywords in "Generating Honeywords from Real Passwords with Decoy Mechanism". In this mechanism if adversary enters the honeyword for login it will it will trigger an alarm notifying the administrator about a password file breach. If the number of attempts exceeds the count of three or enters the password other than honeyword then the access will be issued but the files available will be decoy files. Thus, decoy mechanism secures the data of the legitimate user. System keeps the data of tracked IP's with them and uses them to take appropriate action against the malicious users [5]. But what if the adversary luckily chooses the original password from the sweetwords, then the data is in wrong hands.

III. DISCUSSION

Reviewing of these existing work results to that, more improvements can be made. So, to carry out the work and to eliminate the previous drawbacks some enhancements like key protection will be

added which will act as a two step authentication method to get access to the original data.

IV. FUTURE SCOPE

The Future scope of honeyword concept is very vast. This system can be applied on various domains like:

- ✓ In Online shopping, nowadays expensive things are also sold online so information and location of the items can be protected using this system.
- ✓ In Banking OTP's can be replaced by this system, as it's a hassle to handle OTP .
- ✓ Vaults System in various domains can have this system to protect valuable items.
- ✓ E-mail clients can use this mechanism to protect their valuable documents and mails.
- ✓ Surveillance system can use to keep their data secure from hackers.
- ✓ This System can be used with fingerprint Scanner or Face Recognition can become more secure.

V. CONCLUSION

Security system based on Honeywords addressed a number of faults that need to be handled before successful release of the scheme. In this way, the strength of honeywords will be figured out and used for Data Prevention in this system .There is a huge scope of Honeywords in future as passwords cannot extinct and also they are the base of security & protection.

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Design ,Systhesis and Implementation of Ofdm on An Fpga

Shoubik Das*[1], Rushika Khubalkar[1],Shruti Durbude[1], Shradha .D. Rangari[1], Prof. Sanjay Ganar[2]

[1]extc Student, Rtmnu/Acet, Maharashtra, India

[2]Associate Professor extc Student, Rtmnu/Acet, Maharashtra, India

ABSTRACT

Growth In Technology Has Led To Unmatched Demand For High Speed Architectures For Complex Signal Processing Applications. In Wireless And Mobile Communications, Multipath Fading Severely Degrades The Quality Of Information Exchange. The Orthogonal Frequency Division Multiplexing (OFDM) Technology Is Able To Provide A High Transmission Data Rate With Enhanced Communication Performance At A Relatively Small Bandwidth Cost, Together With Proper Estimation And Compensation Of Channel Effects. Orthogonal Frequency Division Multiplexing (OFDM) Is Used. It Will Be A Hard Core Technology Used In The Future Mobile Communications. 4G Wireless Communication Systems, Bandwidth Is A Precious Thing, And Service Providers Are Continuously Trying To Accommodate More No Of Users Within A Limited Available Bandwidth. To Increase Data Rate Of Wireless Medium With Higher Performance And To Overcome The Frequency Selective Fading, Inter-Symbol Interference (ISI) Effectively, The Basic Principle Of OFDM Is Studied In This Paper And Modeling Was Carried Out In MATLAB SIMULINK AND XILINX 14.2.

Keywords: Research Paper, Technical Writing, Science, Engineering And Technology

I. INTRODUCTION

Orthogonal Frequency Division Multiplexing Or OFDM Is A Modulation Format That Is Being Used For Many Of The Latest Wireless And Telecommunications Standards. Orthogonal Frequency Division Multiplexing Has Also Been Adopted For A Number Of Broadcast Standards From DAB Digital Radio To The Digital Video Broadcast Standards, DVB. It Has Also Been Adopted For Other Broadcast Systems As Well Including Digital Radio Mondiale Used For The Long Medium And Short Wave Bands.

Although OFDM, Orthogonal Frequency Division Multiplexing Is More Complicated Than Earlier Forms Of Signal Format, It Provides Some Distinct Advantages In Terms Of Data Transmission, Especially Where High Data Rates Are Needed Along With Relatively Wide Bandwidths.
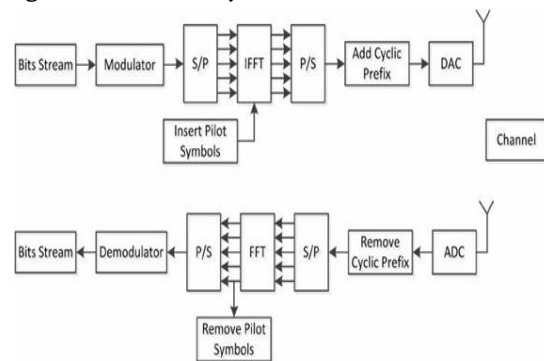
Figure 1. Block Diagram Of Ofdm

II. WHAT IS OFDM?

Ofdm Is A Form Of Multicarrier Modulation. An Ofdm Signal Consists Of A Number Of Closely Spaced Modulated Carriers. When Modulation Of Any Form - Voice, Data, Etc. Is Applied To A Carrier, Then Sidebands Spread Out Either Side. It Is Necessary For A Receiver To Be Able To Receive The Whole Signal To Be Able To Successfully Demodulate The Data. As A Result When Signals Are Transmitted Close To One Another They Must Be Spaced So That The Receiver Can Separate Them Using A Filter And There Must Be A Guard Band Between Them. This Is Not The Case With OFDM,

III. GENERAL DESIGN AND IMPLEMENTATION METHODOLOGY

The Proposed System Is Designed Using A Top–Down System Design Approach And Targeted To The IEEE 802.11a Standard. System Performance Will Be Presented And Compared Between Different Channel Models
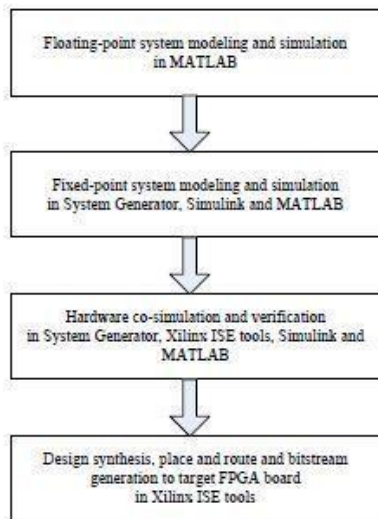
Figure 1. Shows The Design Flow, Which Includes Four Major Steps

1) Floating-Point System Modeling And Simulation :-

The Physical Layer (Phy) Specification Of The Ieee 802.11a, The Information To Be Transmitted Is Modulated Using A Quadrature Phase Shift Keying (Qpsk) Scheme.

2) Fix-Point System Modeling And Simulation :-

After Matlab Simulation, The Ofdm System Is Converted Into Hardware Models With Fixed-Point Representation. This Step Is Completed Within A Visualized Platform Embedded In The Simulink, Namely The Xilinx's System Generator For Dsp (Xsg). The System Modeling Starts From A General System Architect

3) Hardware Co-Simulation And Verification

4) Design Synthesis, Place And Route And Bitstream Generation

IV. IMPLEMENTATION OF OFDM USING SIMULINK

Simulink, Technologically Advanced By Math Works, Which Is A Data Flow Graphical Programming Language Which Consists Of In Built Tools For Modeling, Simulating And Analyzing Multi Domain Dynamic Systems. It Offers Tight Integration With The Rest Of The MATLAB Environment And Can Either Drive MATLAB Or Be Scripted From It. Simulink Is Widely Used In Digital Signal Processing For Multi Domain Simulation And Model-Based Design

V. CONCLUSION

The Modern Programmable Devices In Combination With Appropriate Software Packages For Synthesis And Simulation Give A Significantly Accelerated Design Process Of Electronic Systems. The Conclusion That Can Be Made Is This

Approach Is Suitable For Hardware Generation By Model Based Design In Simulink. It Also Gives Potentiality For Simultaneous Design, Simulation, Analysis And Visualisation By Matlab Simulink And XILINX 14.2. All This Gives Contribution To The Development Of The Hardware Based System Design.

VI. REFERENCES

The Heading Of The References Section Must Not Be Numbered. All Reference Items Must Be In 8 Pt Font. Please Use Regular And Italic Styles To Distinguish Different Fields As Shown In The References Section. Number The Reference Items Consecutively In Square Brackets (E.G. [1]).

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"Hermione 1.0"- A voice Based Home Assistant System

Prof. Manish Assudani, A. S. Kazi, P.O.Sherke, S. V. Dwivedi, Z. S. Shaikh

Department of Computer Science and Engineering, Anjuman College of Engineering & Technology,
Rashtrasant Tukadoji Maharaj Nagpur University, Maharashtra, India

ABSTRACT

The smart mirror is a popular project among DIY enthusiasts and it usually consists of a one way mirror with a screen attached to it that displays a static web page. However what this project wanted to achieve through "Hermione 1.0" was something user could interact with. This project's goal was to learn how a Raspberry Pi worked and to understand how to combine the software and the hardware components to create an IOT based project. The main goal of this project was to develop a smart mirror device as well as an operating system to run on similar devices. The device was to look like a regular mirror but would have a screen inside and you would be able to interact with it using voice commands, hand gestures and smart phones. The operating system would support running apps. The main features the Smart Mirror would have would be showing basic weather and time information, being able to add alarms, reminders or notes in a similar way we stick notes on a fridge. User would also be able to read messages and email and interact with the mirror, for example. The software needed to be designed to be modular and responsive in order to fit different hardware. Up to now there have been many Smart Mirror projects but somewhere they lack interactivity. The project aims to change this by letting the user interact using different means.

Keywords: IoT, DIY, Hermione 1.0, Raspberry pi, Mirror

I. INTRODUCTION

Hermione 1.0 is an extension to the Magic Mirror platform on the Raspberry Pi. The Magic Mirror platform provides the user with easy installation of a Smart Mirror for domestic use. Hermione 1.0 brings to the user all the functionalities of the traditional Magic Mirror along with a personal home assistant, Hermione. Apart from having more features than a traditional Magic Mirror, Hermione 1.0 is comparatively easier to install and customize. Hermione 1.0 aims on utilizing the underlying processor in a better way so as to improve the

performance and throughput. A personal Home Assistant thus could be added. Also, the increasing use of Internet of Things (IOT) devices has generated a need of a display that could be used to monitor them. Hermione 1.0, thus, uses various cloud services to integrate this into the list of services that it provides.

The Magic Mirror is a modular smart mirror platform which helps in providing a futuristic view to the rather simple and dull looking home mirror. The current implementations, although great in User Interface (UI) and User Experience (UX), do

not utilize the underlying processor to the full of its potential. Also, in the existing implementations, the ratio of the number of features included to the cost of the product is so small that mass production of such devices has become commercially unviable. Services like personal home assistants and IOT Displays are the need of the time. However, there exists no medium which could unite these services into one head. Hermione 1.0 brings together all of these features into the Magic Mirror platform and thus improves the overall experience.

Smart mirrors, such as Magic Mirror and Home Mirror have recently started to be developed by people in the Maker community, with varying degrees of interactivity. However, so far, the features of these mirrors have been limited. This final year project describes how a smart mirror was built from scratch using a Raspberry Pi for the hardware and custom software built on top of Raspbian, a Linux distribution. The goal of the project was to create a Smart Mirror device that people could interact with but also to further develop the technology so that it would let you install and develop your own applications for it.

II. RELATED WORK

This project was inspired by a "Magic Home Mirror" device that we found while browsing the DIY section in a popular website called Reddit. The "Magic Home Mirror" is a Nexus 7 Android tablet attached to a one way mirror. The device has a display with a webpage that shows time and weather information and it looks very futuristic. There were also some similar projects that were built using a Raspberry Pi mini computer, but again it was a static panel with no interaction. The project has a very broad scope covering some current popular topics in the IT sector such as the

Internet of Things, Maker culture and home automation.

The projects and products similar to our smart mirror project cover a large spectrum of functionality and purposes. There were significantly more projects than actual products. Some blame can be put on the fact that the smart home is still an emerging market and is limited by the cost of manufacturing keeping the products out of reach from the everyday consumer. The fact that there were more projects shows the interest in developing a more affordable and functional smart mirror. Although, the actual products developed by a company delivered on features, they were either still in a development phase or already priced too high to be considered a viable competitor.

Table 1. Existing Systems And Features

| Devic	Features	Usage & Not	Website
Magic Mirror	Informational display , no user	Hobbyist project for personal	http://michaelteeuv.nl/taged
Samsung Smart Mirro	3d camera gestures control, voice control	Expensive luxury device, out of price range for	http://wwwbusinessinsider.com/samsu
Tech H20 televisions	Displays that also function as mirror	Only the mirror display component; no UI is involved with the device	http://www.tech2o.tv/

III. METHODS AND MATERIAL

Research of this project was done for about a month over the different available sources on internet and from there we came to know that there are many

such ideas implemented before, but as the research says none of the idea has assembled all the different facilities together, so from this we came to the conclusion that assembling all the different features together with some extra functions we can create a better product for use that will enhance the user facility and will keep them in touch with the technology of the real world.

One of the Major challenges in the implementation phase was the part of communication between all the technologies that are being used. The flowchart below describes the data flow between these components.

Following is the **flow diagram** of the Project that will highlight the actual data processing and the implementation of the project:
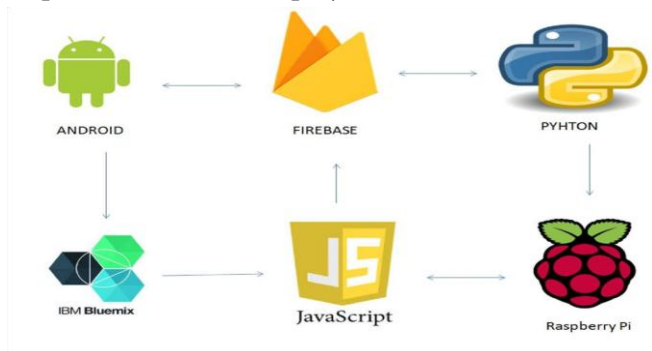
Figure 1. Flow Diagram of Technologies used

• PHASE 1 -

The inception of the Project was done with developing the Web Pages which were linked with the Firebase Back End Support. The development of the Web Pages was done using HTML5 and CSS. Linking with the Firebase Database was done using JavaScript. Once tested, these pages were deployed on the Raspberry Pi. The Raspberry Pi was configured to load the web pages at boot and display the result in the Landscape mode. So, the first phase had a working website which was linked with the Firebase System. The Web Pages currently

had data about the date and time, the weather, the news. Also, an Alarm Clock module was integrated.

• PHASE 2 -

The controlling of the web pages until this point was done by manually changing data into Firebase. There was a need to do this in a hands free way. The Android application thus was developed. The Application used the same database as the Web Pages did. The application was linked and tested. Now, the user could change the current web page just by the click of a button.

• PHASE 3 -

The user would always not have the Smart Phone. Considering this constraint, there arises a need to provide input to the Pi directly. This was achieved by using the PocketSpinx Module of Python. Linking Python to Firebase was done by the Pyrebase Library.

• PHASE 4 -

Now, was the time to add the Home Assistant, Hermione? The Google Text to Speech Module of Python was used to achieve so. All the coding was done in Python, and the script for listening as well as for delivering the speech continually ran on the Raspberry Pi.

• PHASE 5 -

Next, the Bluemix Cloud Platform was used to display the status of IoT devices. Due to budget constraints, the device we used was an Android Phone. The phone was linked with the Cloud. All the data like temperature, accelerometer readings, and current location were accessed. We chose to display the current location of the device onto the Pi.
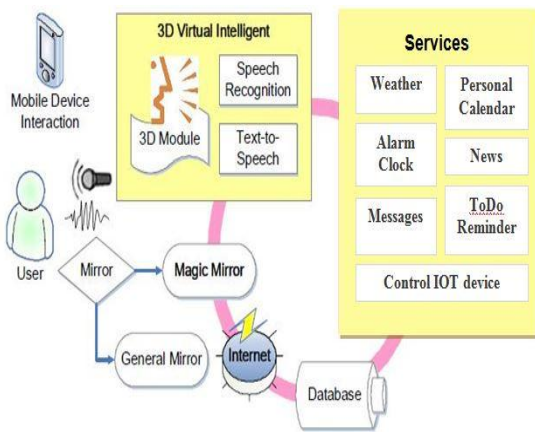
Figure 2. Function diagram of Hermione 1.0-mirror

IV. RESULTS AND DISCUSSION

The research in the first semester allowed for the team to learn about the different components in the design and get familiar with what we actually need to acquire. The design evolved along with the research to fit what is actually possible and what needs to be done to stick to the timeline and budget. The budget for the smart mirror project was developed early on in the project process. The original budget was setup with slight overestimates in each category to allow for movement of costs around to different components once proper research had been conducted.

Table 2. Materials Required For The Mirror

Sr. no	Equipment	Cost
1.	Raspberry Pi 3 Model B	`3228.00
2.	16GB MicroSD card	`499.00
3.	LCD Monitor	`3500.00
4.	Two-Way mirror +Wooden frame	`1200.00
5.	HDMI cable + HDMI to VGA connector cable	`500.00
6.	USB charger and Extension cables	`500.00

The final results of the project are satisfying as almost all modules are running successfully; just the mounting of the mirror in the whole frame is yet to be assembled.

The final Deliverables from the project are --

1. **Android Application:**
   - For customizing the display.
   - For obtaining the voice inputs.

2. **Magic Mirror:**
   - Will exhibit the current status of all the connected IoT devices and control them.
   - Will display notifications for E-mails, Messages, and Phone calls.
   - Will get general purpose information like the Date, Time, News, etc.

3. **Home Assistant:**
   With 'Hermione' the user will be able too
   - Exchange pleasantries.
   Change settings & get status information.
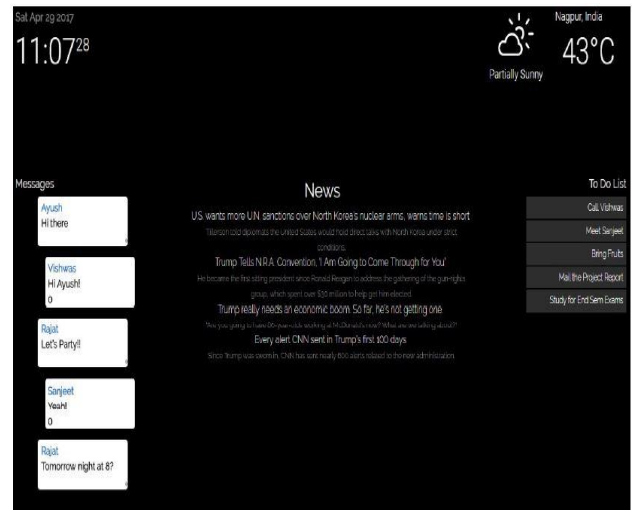
Figure 3. The Mirror interface which will display various notifications, messages, ToDo lists, etc.
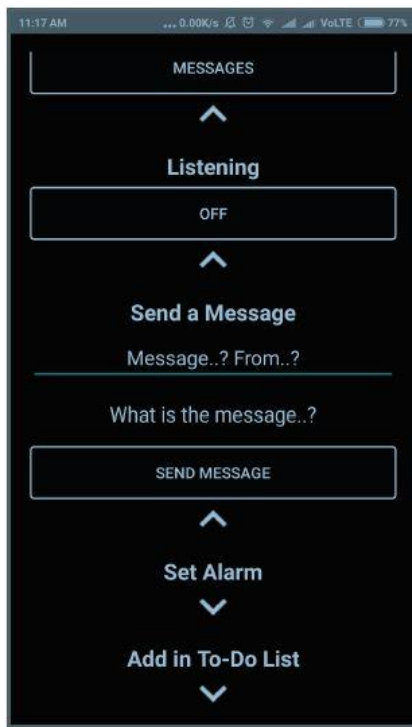
Figure 4. Screenshot of the Android Application to control the Mirror and provide voice input

V. CONCLUSION

This project will help to improve the Magic Mirror Platform. It is a Smart Mirror already and brings together two widely used features, that of a personal home Assistant and that of a device which would display the status of an IOT device. Hermione 1.0 is easy to deploy and has an edge over all the current implementations of the Magic Mirror.

There are many future possibilities for this project and hopefully it will be continued. The future implementations of the project would be to connect the voice assistant to various home, office appliances and control the appliances through voice commands.

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Android Smart Ticketing system using QR-code

Ankita Sonkusale*, Rashmi Chatap, Sana Lulania, Bhavana Pande, Prof. Kamlesh Kelwade, Prof. Kaneez Khatoon

Department Compter Science & Engineering, Anjuman College of Engineering & Technology, Nagpur,

Maharashtra, India

ABSTRACT

In today's world digitalization in every domain needs reworked and reframed. Advancement in existing systems has improved the efficiency by adding another feature to online transaction. In this work we present bus ticketing system making it easier for the commuter to travel in the bus and the ticket checker to keep exact records of the passengers. This System is a web and android based system where through an app passenger detail information and the bus with connected QRcode scanner. It is possible to set the fares and bus stops and to keep and monitor the current updates of a particular bus and passengers on it. This System has the potential of letting the admin know where the bus is exactly and how many passengers are travelling on the bus with their details. From the Passenger's point of view this system make it easier for them to travel as they need not use cash for tickets and the fare for their travel is automatically deducted from their account or wallet.

Keywords: Android, MySQL, Ticketing System, Ticket checker, , QR-code scanner

I. INTRODUCTION

An extensive use of mobile technologies has resulted in increasing interest in various sectors. Today tons of transactions are being done online by using various options for example online banking, credit card or debit card etc. In transportations and travel sector is not last in Smart phone race, today the people use Smart phone for booking the tickets online. India's population is increasing day by day, and lot of people are using buses for travelling to their desired destinations. Due to increase in the number of travelling passengers by local bus, it is time consuming and frustrating process to buy tickets in a standing queue. To encounter this, the bus corporation had introduced the concept of passes but loss or theft of passes proved to be uneconomical.

Our project deals with implementation of a smart-phone application to buy a local bus ticket which is simple and easy to use. The customer application consists of Registration and buying ticket through QR-code. Payment can be done through user's account i.e. if user is agree to buy ticket then the travel fare amount of the ticket will be deducted from the users account. After payment, ticket is generated on server side, saved in the database and also sent back to the user mobile and saved in the application's memory which serves as a ticket for the user.

The ticket checker application is used to validate the ticket by entering the serial number obtained by the user and searching in the bus database to check whether the user's ticket is valid or invalid.

Features of System

- ✓ The Commuter can go cashless and the amount is automatically deducted without any inputs given to the app.
- ✓ The Consumer can view all his previous travels.
- ✓ The Admin has all the details regarding the bus and the passenger travelling in that bus.
- ✓ Easy to track and monitor everything.
- ✓ If the passengers account has no fund the system gives an alert.

II. LITERATURE REVIEW

In review made with references, inorder to introduce the featured system as above mentioned to resolve difficulty faced in earlier system studied as under. The existing system is based on paper tickets. The value of paper-based paper tickets versus E-Ticket or Electronic Tickets has often been debated. Many studies have been conducted on both methods with the pros and cons of each explored. Simply put, the benefits of using E - Ticket or Electronic Tickets far outweigh the benefits of using traditional paper evaluations. A major disadvantage of paper ticket is the high cost associated with the process. The number of personnel involved as well as the printing, distributing, scanning, rekeying, filing and archiving is very costly. When institutions move to an E-Ticket or Electronic Tickets these significant costs can often be reduced by at least 50 percent.

Drawbacks from existing system were:

- ✓ Paper based system is highly costly and not nature friendly.

- ✓ Maintain ticket details for commuter is not possible
- ✓ Risk of loss or damage of paper which cost more to commuter
- ✓ Hardware based system need time to time maintains
- ✓ Hardware based system are difficult to carry and need addition care in buses.

III. PROPOSED SYSTEM

Need for system that provides an On Go online ticket generation without using any paper or hardware for generating and scanning the ticket. Today is the day of Smartphone where everyone have hand held devices which are enough to process the ticketing generating and scanning functionality. All users across the world are used to it. That's way we develop Android based Ticket Generation system Using QR Code. With the rapid advances in mobile communication technologies, QR code in the embedded camera devices has been used as new input interfaces. However, the previous Works for extracting QR code from an image do not consider a non-uniform background. In this paper, we implement the applications of QR code and propose an efficient algorithm to extract QR code from the non-uniform background. In contrast with prior works, our approach is of higher accuracy for QR-code recognition and more practical for use in a mobile information environment.

In the proposed system consist of following modules:

Admin:

- Add Commuter: The Admin will take few details of the User and provide him the QR code and an email will besent to the passengers email id for the password.

- Add Buses: The Admin is responsible to add busses.
- View Buses/Routes: The Admin is allowed to view buses and routes.

Ticket Checker / QR code App:

- Scans: The Scanner scans the QR code which contains destination details, commuter's id and tells the app about the passenger detail also checks whether the passenger's account has sufficient amount and deducts the amount from the passengers account for the travel. Once the QR code is scan its mark as used in server. Each QR code has an id using that it wl mark as used.

Commuter's App:

- Login: The user has to login using his id and password and he is remembered the system until he logs out.
- Add Money: The user is allowed to add money into his account using his Debit or Credit Card.
- History: The user is allowed to see his previous travelling histories.
- Generate QR code: The user can generate QR code for their route which scan by the driver app.
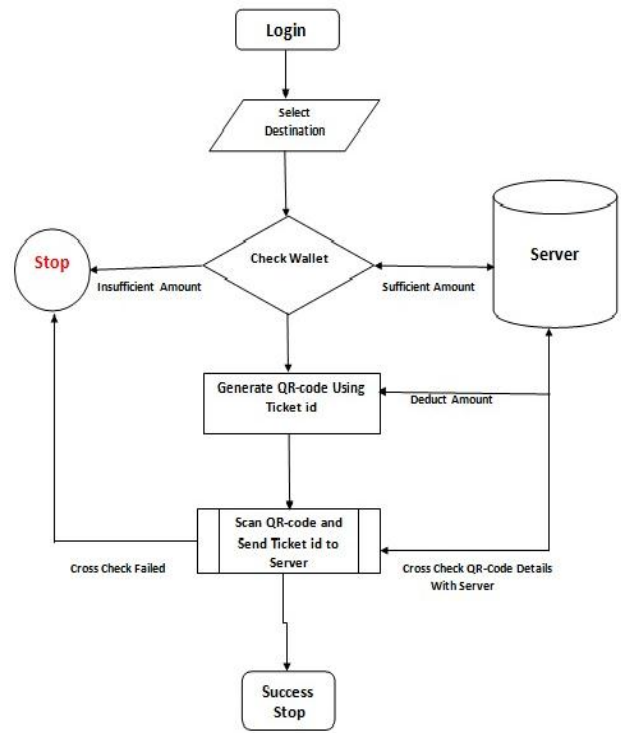
Figure 1. Flowchart for proposed system

IV. IMPLEMENTATION AND RESULTS

In the admin module we developed Web site using bootstrap and JSP. The website have different options to add bus, driver, conductor etc. We designs all the UI with css3 of bootstrap framework. Bootstrap is Responsive JavaScript frameworks which provide a support files to create a website. The beauty of bootstrap is that we can create a responsive UI interface which almost displays proper on any screen size. For the backend part we use Java J2EE and Servlet to implement service and application logic .We use JDBC to connect with database. MySQL is utilize for database and we create a schema in that with various tables to save project data like bus details, user details, conductor details, ticket details etc. for each details there is a table in MySQL. The results using the screen shots of Commuter App, Scanner App and Admin Panel are provided below.

Admin Menus:
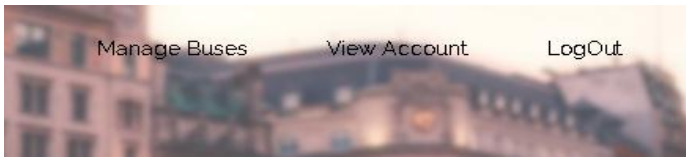
Figure 1 Admin Menus

Admin have various options to manage the application like

- Adding, updating Buses
- Adding Driver and Ticket Checker
- Commuter Details
- Account Details

Add Bus:

To add a new bus Admin needs to provide following sets of details

- Bus No, Latitude, Longitude, Amount, Source,   Destination, Distance, Time.

Figure 2. Add Bus

Driver& Conductor:

Admin can add driver and conductor details to any bus.

Figure 3. Add Driver& Conductor

View fare amount
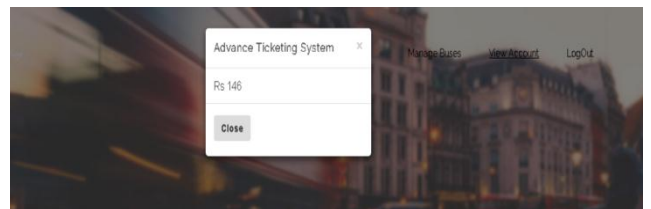
Figure 4. Fare Amount details

List of Buses with Source and Destination

Figure 5. Buses with Source, Destination and routes

Commuter App:

It needs setting to configure the server IP and Port number to fetch the details

Figure 6. Home Screen

Ticket Scanner App:

Figure 9. Scanner Screen
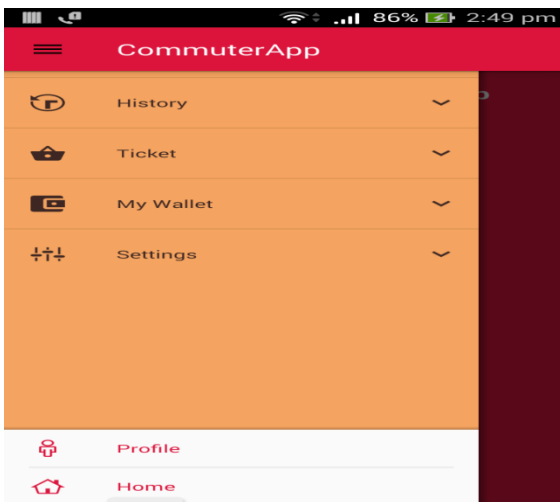
Figure 7. Dashboard Screen
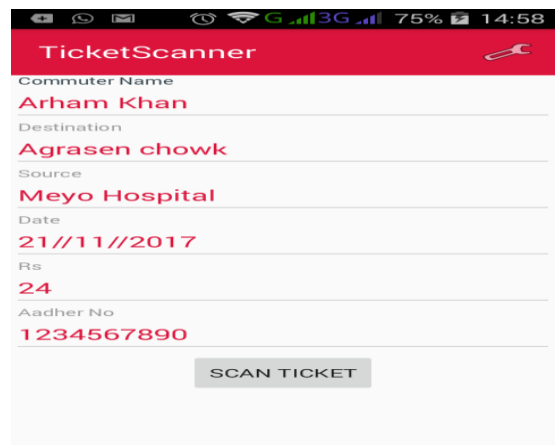
Figure 10. Scanner Result
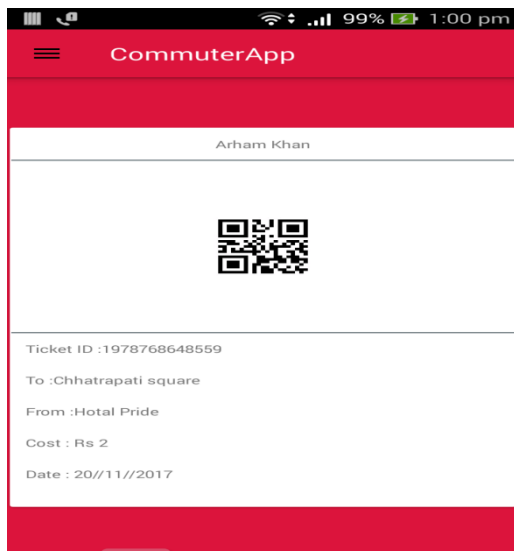
Figure 8. Ticket Output
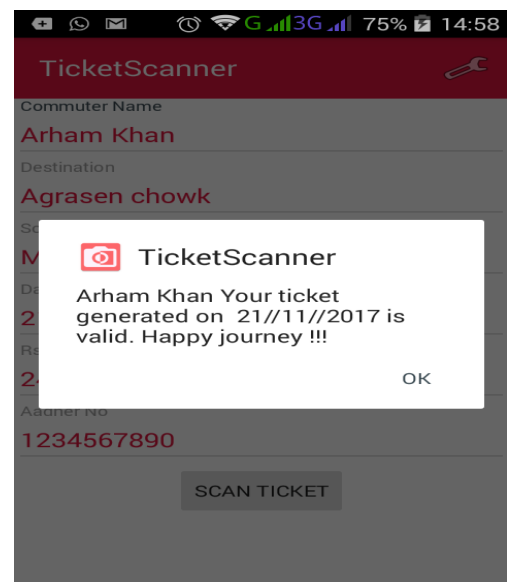
Figure 11. Valid Ticket Alert

V. CONCLUSION AND FUTURE SCOPE

The application developed will be feasible for novice users as well as professional users. The application will be used for the booking a ticket without standing in queues for travelling through local buses and it's easy for ticket checker to check whether ticket is valid or invalid. This android application reduces the manual work of both ticket bookers and ticket checkers. It is basically the transition from a manual to digital system for ticket booking of as well as ticket checking of Local buses. Application needs to implement such that different user can register using social sites account. It shall be able to delay of buses and their routes delay for booking from web application.

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Smart Department System International Journal of Scientific and Research Publications

Er. Alisha Fazlani , Er. Aaliya Khan , Prof. Imteyaz Shahzad
Research student, Department of Computer Science & Engineering, Anjuman College Of Engineering &
Technology, Nagpur, Maharashtra, India

ABSTRACT

Smart Department System is an application which includes different modules for parent login, faculty login and student login and manages all activities of department at one place. Department management is becoming a very essential component in education in this modern day age. With the help of Smart Department System we can gather all the useful information needed to the management in few clicks. Smart Department System consists of different modules such as student, faculty, admin etc. Our main purpose is to create a software which will manage the working of these different modules. The interconnectivity among modules reduces the time to perform different operational task. Smart Department System is the software which gathers the basic information of student automatically. This software manages the information about various users including faculties, information about subjects offered in various semesters; marks obtained by Students in different semesters and then generate a final report of each and every student. We have used bootstrap which increases the responsiveness of the system. If in future we want to implement this system as the web based application because of bootstrap it will be easy and automatically screen will resolve according to that. The objective of our system is to reduce the paper work and to eliminate manual processes and to save significant staff time

I. INTRODUCTION

- Smart Department System is an application which includes different modules for parent login, faculty login and student login and manages all activities of department at one place.

- Department management is becoming a very essential component in education in this modern day age. With the help of Smart Department System we can gather all the useful information needed to the management in few clicks.

- Smart Department System consists of different modules such as student, faculty, admin etc. Our main purpose is to create a software which will manage the working of these different modules. The interconnectivity among modules reduces the time to perform different operational task.

- Smart Department System is the software which gathers the basic information of student automatically. This software manages the information about various users including faculties, information about subjects offered in various semesters; marks obtained by Students in different semesters and then

generate a final report of each and every student.

- We have used bootstrap which increases the responsiveness of the system. If in future we want to implement this system as the web based application because of bootstrap it will be easy and automatically screen will resolve according to that. The objective of our system is to reduce the paper work and to eliminate manual processes and to save significant staff time.

- Smart Department System is the intranet based software which will help the students to view notices, view attendance and also staff to upload question bank, assignments etc.

This application includes 3 login portal.

- Faculty Login
- Student Login
- Parent Login

1. Sign up Form:

Sign up means "to register; to create an account". This module provides user a signup form in which user fills all the essential information which are used for login purpose.

2. Login Credential:

In terms of security, login is the process by which an individual gains access to a system by identifying and authenticating themselves.

- ✓ Student
- ✓ Parent
- ✓ Faculty

3. Student Portal:

Student module consist of two submodules, first is data card in which all the important information related to student are required.

- ▪ Ex: Personal details, Academic details & Extra activities.

4. Parent Portal:

In parent module, all the information (like marks, attendance & performance) related to the students are visible to their parents.

5. Faculty Portal:

This module is related to faculty. Faculty can add, delete or update the information of the students in this module.

II. RESEARCH ELABORATIONS

Existing System

- By surveying the different college websites, we found out that neither of the colleges had a feedback form nor a parents information portal.

- It is a must for the respected parents or the guardians to know how well their ward is performing at the institution or where he or she is at currently.

- Yes we are including a student tracker to know their current location, this will ensure that the students are REGULARLY attending the college.

- By looking at the above existing systems we observe that we have to do double work i.e. first the teachers have to take the attendance manually and then upload to the college database.

- An increase of manpower takes place since the use of paperwork is increased at a considerable rate.

- In existing systems the parents cannot get the location of their ward.

- It is a must for the respected parents or the guardians to know how well their ward is performing at the institution or where he or she is at currently. Yes we are including a student tracker to know their current

location, this will ensure that the students are regularly attending the college.

- This application will even display the marks and attendance of the students for all the subjects. Even the faculty members can be contacted on a short notice. The feedback form will be filled only by the student in the entries of good, average, and excellent. An extra field will be provided for suggestions if there is any problem with the teaching style then you can comment on them. Your suggestions will be posted anonymously so your identity will be hidden.

Proposed System

- This is the generic type of software which is suitable to all the colleges. The software mainly consists of three portals i.e. student portal, faculty portal and parent portal.
- This application can be easily implemented in various situations. We can add new feature as and when we require. It is open for future enhancements.
- Reusability is possible as and when we require. There is flexibility in all the modules.
- The software is extensible in a way that its developer may not expect. Reusability is possible. Reusable software reduces design, coding and testing cost by amortizing effort over several designs.
- The proposed system is user friendly because the retrieval and storing of data is fast and data is maintained efficiently.
- The existing system which we use in our college is traditional process which is a complete manual process (for e.g. feeding student information in excel sheet manually).
- The software Smart Department System facilitates the Faculties and Head of the

departments to know the present status of a student.

- The software gives the information such as student personal data, student's present Location, student activities and results etc.
- The parents will be given timely updates regarding any student activities that are held in the college and also about Parents Teachers Meetings.
- The main objective of the project is to manage the details of college, course, students and faculty.
- The project is built at administrative end therefore only the administrator or the authorized person (for e.g. HOD) is guaranteed the access.
- The application can be used in any other colleges.
- The application keeps the track of student's current location.
- This application can further be used in future as office automation system where employee data can be stored at one place.

III. RESULTS

- By using Existing System accessing information from files is a difficult task and there is no quick and easy way to keep the records of students and staff.
- Lack of automation is also there in the Existing System. The aim of Our System is to reduce the workload and to save significant staff time.
- This System provide the automate admissions no manual processing is required. This paper assists in automating the existing manual system. This is a paperless work.

- It can be monitored and controlled remotely. It reduces the man power required. It provides accurate information always.
- All years together gathered information can be saved and can be accessed at any time.
- The data which is stored in the repository helps in taking intelligent decisions by the management providing the accurate results.
- The storage facility will ease the job of the operator. Thus the system developed will be helpful to the administrator by easing his/her task providing the accurate results. The storage facility will ease the job of the operation.

IV. CONCLUSION

- This is the generic type of software which is suitable to all the colleges. The software mainly consists of three portals i.e. student portal, faculty portal and parent portal.
- This application can be easily implemented in various situations. We can add new feature as and when we require. It is open for future enhancements.
- Reusability is possible as and when we require. There is flexibility in all the modules.
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- The parents will be given timely updates regarding any student activities that are held in the college and also about Parents Teachers Meetings.

V. JOURNALS

1. IJIRST –International Journal for Innovative Research in Science & Technology: College Automation System.
2. International Journal of Advanced Research in Computer Engineering & Technology (IJARCET): Android College Management System.
3. Multidisciplinary Journal of Research in Engineering and Technology: ERP System for College Automation Using Rfid Tags.
4. International Journal on Recent and Innovation Trends in Computing and Communication: Information Management System for Faculty and Students.
5. International Journal of Innovative Research in Computer and Communication Engineering: Web Based Application for College Automation System.
6. International Journal of Advance Research, Ideas and Innovations in Technology: Institute Administration Automation and Student Database Management System.

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GPS Based Vehicle Tracking and Engine locking System

Mr. Anurag Rajendra Bharadkar, Mr. Mukesh Kumar Hansraj , Mr. Shubham Devidas Harshe, Ms. Pooja Keshav Walke , Ms. Sneha Gangadhar Ghule

Department of Electronics and Telecommunication Engineering , Guru Nanak Institute of Technology, Nagpur, Maharashtra, India

ABSTRACT

Security systems and navigators have always been a important part of human‟s life. The developments of advanced electronics have brought revolutionary changes in these fields. In this paper, we will present a vehicle tracking system that use a GPS module and a GSM modem to find the location of a vehicle and offers a range of control features. To complete the design successfully, a GPS unit , a relay, a GSM Modem and a MCU units are used. There are five features made known in the project. The purpose of this project is to remotely track a vehicle‟s location, remotely switch ON and OFF the vehicle‟s ignition system and remotely lock and unlock the doors of the vehicle. An SMS message is sent to the tracking system and the system acknowledges to the users request by performing convenient actions. Short text messages are authorized to each of these features. A webpage is specifically designed to view the vehicle‟s location on Google maps. By using relay based control concept introduced in this paper, number of control features such as turning heater on/off, radio on/off etc. can be execute in the same fashion.[1]

I. INTRODUCTION

The vehicle tracking system is an electronic device that tracks the vehicle‟s location. Most of the tracking systems use GPS module to locate the vehicle‟s position .Many systems also interface communication components such as satellite transmitters to communicate the vehicle‟s location to a remote user. Google maps are used to view the vehicle‟s location. The design of the tracking system is divided into three parts; basic design, intermediate design and an advance Design. The basic design of the vehicle tracking system consists of a GSM module, a GPS module, a MCU (ATMEGA 32), a Relay circuit and a LCD. The user sends SMS and the system responds to the user's request by providing the coordinates of a location in accordance to the requirements of mobile phone users through the GPRS network. The intermediate and advance design is an improvement of the basic design. There are five features introduced in the project. SMS codes are specifically assigned to each of these features. For example, if the user sends 555 to the tracking system. The GSM modem will receive the SMS and transmit to the MCU unit, where the SMS code will be compared against the codes stored in the library. In this project, the code ‟555‟ is assigned to find the location of a vehicle. So, the MCU will get the location from the GPS module and reply back

to the user with the location coordinates (i.e. Longitude and Latitude). These coordinates can be used to view the location of a vehicle on Google maps. The vehicle tracking system presented in this paper comprises of a cost effective and special tracking technology. The tracking systems are not only bounded to shipping industry and fleet tracking but also used in cars as a theft prevention tool.

This paper provides an overview of the background analysis related to vehicle tracking and control systems, component"s choice and full development process of the tracking system. The paper is divided in five main sections: related research, choice of components, design of a system, simulation of designs and implementation process. In the related research section, we will outline the research carried out so far. Then, we will discuss the components used. The design section will focus the software and hardware design process. The assembly of components will be explained in the implementation section. Finally, the implementation process section will include the software simulations and images of the hardware in working condition.[2]

II. RELATED RESEARCH

There are n number of papers has been published on the development of vehicle tracking system using GPS and GSM Modem differential GPS algorithm that is capable of providing real-time near PPP service is presented In error sources in GPS measurement are calculated ,vehicle navigation application is presented. A web application and a mobile application related to vehicle tracking are presented. Safety challenges related to tracking

system and GPS are discussed in great detail. A novel method of vehicle tracking is presented in using wireless sensor technology, passive sensors, android based tracking self-power tracking system and tracking system based on cloud computing infrastructure. A vehicle tracking system based on color histogram distance and binary information is implemented. In development of real-time visual tracking system for vehicle safety applications is discussed and the concept of focus of expansion (FOE) is introduced. A low cost real time tracking system that provides accurate localizations of the tracked vehicle is presented in .Vehicle tracking coupled with vehicle registration number recognition is introduced in Following huge demand of accurate vehicle tracking systems, researchers proposed number of novel methods to improve the accuracy of tracking systems.[3]

III. CHOICE OF COMPONENTS

1. The Microcontroller unit (MCU)

There are two ways to control an electronic circuit either using: Microprocessor or MCU. The Microprocessors are usually referred to as general-purpose microprocessors because they do not contain RAM, ROM and I/O ports. So, system designers have to add an external RAM, ROM and I/O ports to make a system functional. Addition of these components will make the system bulkier and much more expensive. The advantage of using microprocessor is that the designer can decide the amount of RAM, ROM and I/O ports needed to accomplish a task.[4]

Figure 1. Microprocessor

However, MCUs have a CPU in addition to the fixed amount of RAM, ROM and I/O ports, which are embedded on a chip with support functions such as a crystal oscillator, timers and serial or analog input output (I/O) The MCUs are designed for embedded applications and can be used in remote controls, power tools, toys and other appliances. Invention of MCUs has reduced the size and cost of designs. MCUs are suitable where cost and space are critical. There are four types of MCUs (8 bit): 8051 family, PIC, Zilog and Freescale. The MCU families are not compatible with each other, which means, if we write a code for 8051 MCU it will not work on PIC MCU. This is mainly due to different instructions and registers set in each MCU.

Figure 2. AT MEGA 32 IC

To choose among these MCUs, there are specific criteria set for designers: MCU should meet the task at hand efficiently and cost effectively. Software development tools such as compilers, assemblers and debuggers should be available in the market Wide availability and reliable sources of the MCU used. Designer should also consider the speed, Packaging, power consumption, the amount of RAM, ROM on chip and cost per unit [6]

(a)   (b)

Figure 3. (a) PIC Microcontroller (b) Zilog Microcontroller

2.GSM Modem

A GSM module is a second generation digital mobile cellular technology, which covers a fairly broad geographic area. This offers customized travel, financial, reference and commercial information to the users It can operate in 400MHz, 900MHz and 1800MHz frequency bands. The GSM modem can accept a SIM card just like a mobile phone and operate on a subscription to a network of mobile data transfer. The GSM Modem supports three types of services namely bearer or data services, supplementary services, and telecommunication services. A typical GSM picture is given below:
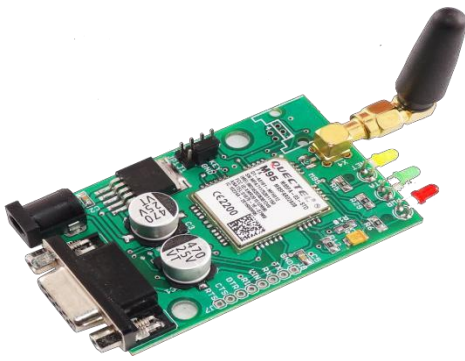
Fig.4. A GSM Modem(Global System for Mobile Communications).

3. GPS Modules

The first GPS (navigation system) was designed by Honda in 1983 Pioneer claims to be the first with a GPS-based auto navigation system, in 1990 Magellan claims to have created the first GPS-based vehicle navigation system in the U.S in 1995.

Each GPS (satellite) transmits data that indicates the current time and its location. It transmits signals to a GPS receiver. This receiver requires an unobstructed view of the sky, so they can only be used effectively outdoors.[8]

Figure 5. GPS Module

4 .Vibration Sensor

Vibration sensor is capable of measuring vibration of the engine when it starts. If the vehicle met

an accident, the sensor will send voltage equivalent to the intensity of hit, to the microcontroller at once. Then microcontroller sends a notification to the owner/contact list as SMS, if the sensed signal voltage is greater than or equal to some stored threshold value.

So this will be helpful to report any accidents occurring at night. Thus we use this sensor for security of rider. There are two threshold values one to detect intrusion and another to detect accidents. In the security system piezoelectric sensor is used. It is generated by pressure on certain crystals which will develop a potential difference or voltage on the crystal face. If the crystal oscillates, an AC voltage is formed. The sensor is modelled as a charge supply with a shunt capacitor and resistor, or as a voltage source with series capacitor and resistor.[9]

Figure 6. Vibration Sensor

IV. PROCESS OF THE SYSTEM
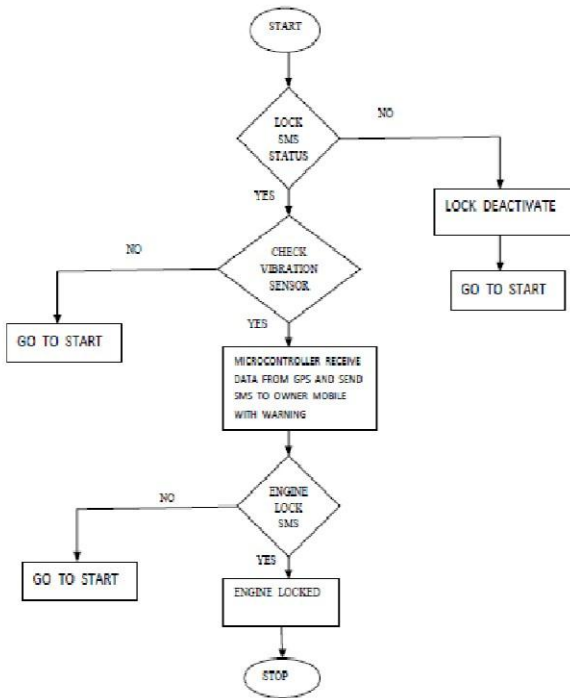
Figure 7. Flow chart of the system

The embedded system is installed in the engine of the vehicle along with GSM and GPS module. The instrument allows to active the 5V and then ignition of the engine will start, hence start the vehicle. The instrument has two modes of operation ,one is user mode and second one is theft mode .When engine will start ,then the instrument will check the lock status, if it is the owner engine will start as user mode and no SMS will be send to owner but if it is somebody else ,theft mode comes into practice and it gives as SMS notification to the concerned party as programmed that is the vibration sensor in the instrument will sense the value of the vibration of the engine.

V. RESULTS AND DISCUSSION
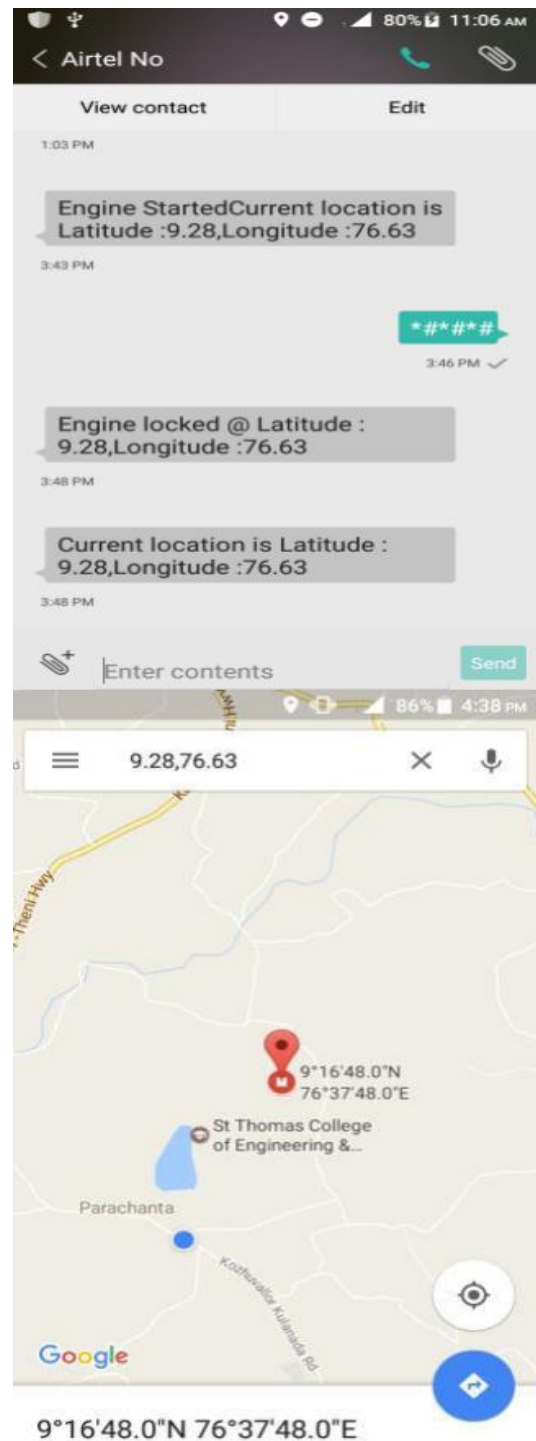
Figure 8. Message send to owner''s mobile and location of vehicle

In this paper, we proposed design of unique engine locking system to control seizing of vehicles using GSM and GPS technology based embedded system. The instrument has simple design, low cost, compact and reliable. This instrument can change by setting lock status field. If the vehicle accessed by unauthorized person, then owner get SMS and lock the system using the password. The delay incurred for engine locking is 2-5 minutes.[11]

If the engine will vibrate more than 10 sec ,then the sensing value is given to the microcontroller. If the value is greater than the threshold value then sending a message "Engine Started" through GSM mobile to owner''s mobile for the further action for prevention of the vehicle theft.

After receiving this message the owner can send password „#‟ for getting the current location of the vehicle, then the longitude and latitude will be received by the owner. If the owner will send password „*‟
,then the owner can lock the engine of the vehicle through this password and receiving a message "Engine Locked" and "current location" is also include As part of the message.[10]

VI. CONCLUSION

Day by day the vehicles increasing so as theft, on the basis of this we can be generate the proposed system that is helpful. When accidents occur during the night time, the incident can report immediately as SMS to the owner''s contact list so that the injured persons can be hospitalized as soon as possible. As future improvement we can add extra features to the proposed system by using hidden cameras in the front and back side of the vehicle so that the details like number of the vehicle is given as SMS to owner''s mobile so

that we can take the details for further investigate, on procedure.[12]

VII. ACKNOWLEDGMENT

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WaSH Services International Journal of Scientific and Research Publications

Er. Anoushka Patil[1], Er. Alisha Narnavere[1], Er. Ayushi Gaikwad[1], Er. Prajakta Wasnik[1], Prof. Itrat Fatema[2]

[1]Research Student, Department of Computer Science & Engineering, Anjuman College Of Engineering &
Technology, Nagpur, Maharashtra, India
[3]Associate Professor, Department of Computer Science & Engineering, Anjuman College Of Engineering &
Technology, Nagpur, Maharashtra, India

ABSTRACT

Public sanitation, as a health hazard, is one of the most critical discrepancies faced by the nation in today's time. Also hygiene and cleanliness is another critical aspect. According to the research about 1/7th of world's population still defecated in the open, of which 60% lives in INDIA. Finding these requisites in a local area can be quite tricky as majority of people are oblivious of their location & also they are not made available on any navigation application and/or tool. According to a UN study on how to improve sanitation globally, more people have access to mobile phone than to a toilet. In this paper, an attempt is been made to provide a tool (WaSH services) that will aid in finding the basic sanitation services according to proximity of our location for effective and timely assistance and a way encouraging people to be a part of "Swachh Bharat Abhiyan" for the people of Nagpur. WaSH services is comprised of three domains Drinking Water Index (DWI), Public Washroom Index (PWI) and Garbage disposal Index (GDI). Every index containing the information of the WaSH service, their location and route from your current location.
Keywords : GDI, WaSH Services, DWI

I. INTRODUCTION

Hygiene, sanitation and cleanliness are the factors that remain unattended and cause major health risks. In India, pneumonia and diarrhoea are the two leading causes of death due to overlapping risk factors. Moreover, there exists an underlying issue regarding awareness and lack of information.

WaSH "Water, Sanitation and Hygiene" – are essential for good health and well-being. It includes several interrelated public health issues that are of particular interest to international development programs. Affordable access to WaSH is a key public health issue, especially in developing countries. Information and communication technologies (ICTs) have the potential to address the information gaps in the WaSH sector by transforming the way data is generated and

utilizing it accordingly while making it accessible to general public. WaSH is a web application with a heavy mobile compatibility.

Nowadays, mobile phones have become ubiquitous in the developing world. Mobile phones are increasingly being used as cost-effective tools for collecting data and disseminating information. In the past decade, water and sanitation practitioners have begun deploying mobile phones as tools to improve water, sanitation, and hygiene (WaSH) services. The WaSH includes intermediate information about accessibility, ease and portability of the aforementioned in a geographical area.

Features of WaSH Services:

1. WaSH services will help in identifying existing water infrastructure that specifically provides clean drinking water free of cost. This not only encourages people to utilise such a resource, but also motivate people to clamor for services that are equivalently exceptional as the ones we pay for.

2. Healthy Hygiene Practices Simple actions can make a huge difference to people's health. WaSH works to promote essential self and community hygiene practices, that include proper usage of public washrooms/lavatories and dump-yards, whenever the need arises.

3. Empowerment, Integration, and Sustainability Helping the society to self-organize and define their priorities when it comes to adapting personal hygienic habits, and empowering them to encourage habits as such to others in the community.

4. Maintainability of Services Once cognizance of WaSH services reaches greater audience, communities become more resilient by

supporting maintenance and sustenance of these services.

II. RESEARCH ELABORATIONS

Problem Definition

Public sanitation, as a health hazard, is one of the most critical discrepancies faced by the nation in today's time. Also hygiene and cleanliness is another critical aspect. Finding these requisites in a local area can be quite tricky as majority of populace are oblivious of their location & also they are not made available on any navigation application and/or tool.

The WaSH (water, sanitation, and hygiene) sector globally has some considerable challenges— both short term and long term:

1. Billions of the world's people still lack access to basic water and sanitation services.
2. In regions where water and sanitation services are being extended, many projects have a high failure rate, but the extent is unknown due to lack of transparency by implementing organizations.
3. Even where formal water supply and sanitation services exist, the service is often unreliable and of poor quality for the most vulnerable populations.
4. Fourth, water systems (and therefore sanitation) everywhere face long-term sustainability threats from over-extraction, climate change, urbanization, and pollution.

Proposed System

WaSH, web application, contains the information of washrooms, garbage disposal/dump yards, and drinking water booths in different tabs which the

user can access as required. Along with the complete information it will help you in finding the nearest one.

It is a fast and simple garbage washrooms, disposal/dump yards, and drinking water booths finder. The database of tens of hundreds of public toilets, dump yards, and drinking water booths is stored on the phone for fast and offline access! Search for a location as well as pan on the map and

it will show the user the nearest service. Tap on the map to get directions provided by Google Maps. Or if user just really need to find any service, tap the directions button and it will give directions to the closest service, no need to fiddle about with anything. The database is constantly expanding and it will tell user whether there is a fee, whether require a key and whether or not they provide disabled access if admin know it.
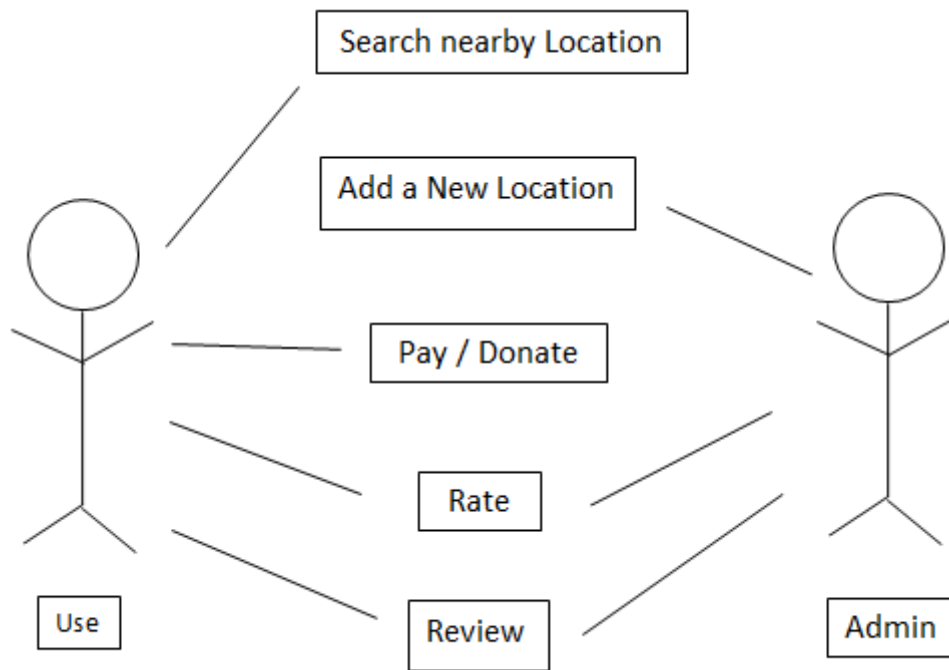
Figure 1. WaSH Services

III. CONCLUSION

From the various research factors and challenges the conclusion is:
- ✓ The ease of access that the user gets makes the tool more user-friendly.
- ✓ Aids in progressing our nation to a better future while reducing access barriers to basic civic services.

- ✓ Encourages people to be a part of "*Swachcha Bharata Abhiyana.*"
- ✓ Provide updated information in the Google maps for more efficient access to information.
- ✓ Analysis of the water and sanitary information can help to identify regions and communities with greater needs and thereby help to design more pro- interventions.

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Design and fabrication of White Coal Pallet Machine

Shubham M. Fale*, Ninand Gaikwad, Mrunali P. Jambhule, Azam Ahmed Khan,
Faizan Ahmed, Atul Bhoyar, Arshad Haseb Sheikh, Prof. Hakimuddin Hussain
B.E. Student, Mechanical, ACET, Nagpur, Maharashtra, India

ABSTRACT

The present paper focuses on production of white coal which is made from a Bio waste as an alternative fuel. With fast depletion of Conventional energy sources such as coal, petroleum and diesel etc. now it's the time to switch over to such resource which is freely available in nature i.e. Bio-waste which proves a good substitute over conventional energy resources. Biomass briquettes avoids adding fossils carbon to the atmosphere. The extrusion production technology of briquettes is the process of extrusion screw wastes (straw, sunflower husks, buckwheat, etc.) or finely shredded wood waste (sawdust) under high pressure. The use of agro waste in the form of solid white coal by adopting the piston cylinder ram pressing technology will not only arrest the ever increasing diminution of conventional fuel like coal lignite, fire wood & furriness oil etc., but also reduce cost of imports and save foreign currency and be helpful to utilize huge resources of forestry waste, agricultural waste and industrial wastages, it is step further to make our country pollution free. There is a tremendous scope to utilize the waste of convention energy sources through the development, propagation of non-convention briquettes technology i.e. briquettes machine, briquettes plant, biomass briquettes plant for production of agro residue briquettes to meet thermal energy requirement. Therefore this substitute energy medium is given national priority as appears to be the only permanent solution into restriction of the national laws and avoid pollutions. White coal is cheaper in cost & raw material is sufficiently available in almost all part of India for production. This machine proofs a boon to rural areas peoples.

Key Words: Agriculture waste, Alternative fuel, Drying waste, Electricity.

I. INTRODUCTION

The legacy foundation has developed a set of technique to produce biomass briquettes through artisanal production in rural villages that can be used for heating and cooking. These techniques were recently pioneered by vicuna national park in eastern democratic republic of Congo. The economics of two countries i.e. India and China are rapidly increasing due to cheap ways of harnessing electricity and emitting large amounts of carbon dioxide.The large scale use of commercial energy has led to better quality of life; however it has also created many problems. Perhaps the most serious of these are the harmful effect on the environment and climate changes which both have consequences on human health and pollution.White coal replace the fossil fuels which is a biomass/ white coal, white coal is totally made from agriculture waste and it does not create any type of pollution.Energy problem is very serious and the main objective is

now to find solution to match demand and supply of energy sources.

The electricity consumption of white coal is much lower than other fuel also possess less ash content as compared to black bustard coal. We can produce small white coal for domestic combustion purpose which is made in white coal machine. The requirement of coal in power plant in metric ton so it is not possible to produce pellet to power plant that is why made white coal from agriculture waste in large quantity which has finished product, 75mm in diameter and 159mm- 400mm length production in white coal press machine.

1.1 Raw Material for Pallets:
There are a wide range of materials that can be used in making of white coal. Deoiled cashew shell, rice husk, dry grass, glyceride, saw dust and cow dung. The carburised cashew shell, rice husk and grass are used as major components for briquetting without any binder material.

Figure 1. Different materials used for making pallets

The agricultural wastes like cotton balls, straws, coconut shells, castor seeds, forest leaves, wood chips and rise husk and paddy straw. Various combinations of major constituents are mixed in

order to get briquettes of desired quantity Different combinations such as 50:25:25, 25:50:25 and 25:25:50 for cashew shell, rise husk and grass are respectively added for observing the properties of briquettes.

Figure 2. Process showing from Bio waste to pallet making.

1.2 LITERATURE REVIEW:
Jing Zhang [1] studied the influence of temperature, pressure, size of particle and moisture content on the physical properties (durability, density, impact resistance & compressive strength) of korshinskii kom briquette press machine. A piston cylinder simple pressing mechanism process was used to densify the material into white coal.

Research on Physical properties Temperature, pressure, size of particle & moisture content - Drying of raw material process can be done in atmospheric condition to reduce moisture content.
Rukayya I. Muazu [3] He identified biomass densification process increase fuel energy density for more efficient transport. It show blending different types of biomass improves the properties of densified white coal. Making briquette or white coal used blending technology.

1.3 MANUFACTURING PROCESS:
This project is called biomass briquetting project and is simply a process of converting agro waste and forestry waste into biomass briquettes/bio coal. The

biomass briquetting is the best renewable source of energy for healthy environment and economy. It's a complete eco-friendly project.

A piston cylinder arrangement is used for reciprocating mechanism of materials. Approx. a cylinder of 90 mm diameter and 400mm length is selected. An air tank for collection of pressurised air is required. A stroke deflector is used for reciprocating the pressurised air throughout the cylinder. A locking mechanism is used to hold the cover of the compressing cylinder. A compressor is required for providing the pressurised air to the machine.
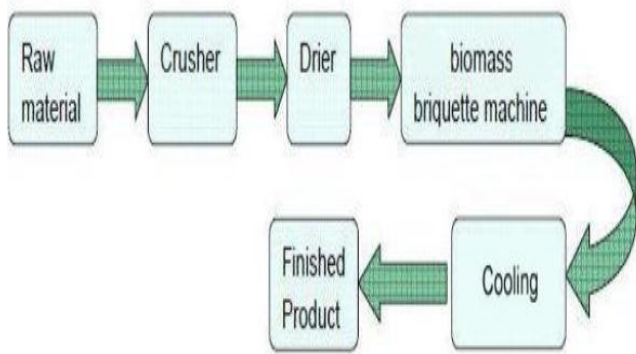
Figure 3. Processes Flow Chart

II. WORKING

The materials are fed into the machine's cylinder up to the brim and is sealed by the cover. The compressor gives the pressurised air to the air tank. After enough volume of air is stored in the tank the pressurised air goes to the deflector. The deflector then pushes the piston upwards so that the other link attached to the piston gets pushed along with it. The deflector then pushes the piston from upward position to downward along with the material. This process repeats itself up to 1 stroke to make a cylindrical briquette. The second stroke is applied to the cylinder while opening up the cover to take away the formed briquette.

Figure 4. Simple Model of Pallet Making Machine

2.1 ADVANTAGES OF USING BRIQUETTES COMPARED TO OTHER SOLID FUELS

➢ Briquettes are much cheaper than ordinary coal.

➢ Oil, coal or lignite, once used, cannot be replaced.

➢ There is no sulphur in briquettes, thus does not pollutes the environment.

➢ Biomass briquettes have a higher practical thermal value.

➢ Briquettes have much lower ash content (2-10% as compared to 20-40% in coal).

➢ Combustion is more uniform compared to coal

➢ Briquettes are usually produced near the consumption centres and supplies do not depend on erratic transport from long distances.

➢ Briquettes give much higher boiler efficiency because of low moisture and higher density.

2.2 ADVANTAGES OF SETTING UP BRIQUETTES PLANT PROJECT

➢ High sulphur content of oil and coal, when burnt, pollutes the environment.

➢ There is no fly ash when burning briquettes.

➢ Briquettes have consistent quality, have high burning efficiency, and are ideally sized for complete combustion.

➢ Combustion is more uniform compared to coal and boiler response to changes in steam requirement is faster due to higher quantity of volatile matter in briquettes.

➢ Compared to fire wood or loose biomass, briquettes give much higher boiler efficiency because of low moisture and higher density.

➢ Briquettes, are easy to store, pack and hygienic to handle.

2.3 Advantages over economic feasibility and profitability

1. Farmer earn money by selling agriculture waste
2. Early payback period
3. Growth potential is excellent
4. High profitability
5. High employment potentiality
6. Product easily market
7. Save foreign currency

2.4 Other Advantages-

1. Reduce CO2
2. Free from pollution
3. High energy content
4. Reduce coal dust level
5. Low transportation cost
6. Broad geographical application
7. Simple mechanism

APPLICATIONS:

1. It can be used in rural areas for the purpose of cooking.

2. Briquetted fuel can be used by the industrial, commercial and household sectors.
3. It is ideally suited for use in the following areas.

Table 1

Boilers	Sugar mills, paper mills chemical plants, cement, food producing units, oil extraction units etc. using fuel for steam generation and heating.
Forges and foundries	For metal heating and melting.
Brick kilns and ceramic units	For firing of furnaces.
Residential heating	For winter heating in cold areas and in restaurants, canteens etc.
Gasification	The gas can be used to generate power, and eventually replace coal based producer gas systems and oil firing in furnaces.
Agriculture	Heating green houses, nurseries and chicken coops.

Following Industries Can Make Maximum Use Of Briquettes:

1. Ceramic and Refractory Industry
2. Solvent Extraction Plant
3. Chemical Units
4. Dyeing Plants
5. Milk Plants
6. Food Processing Industries
7. Vegetable Plants
8. Spinning Mill
9. Lamination Industries
10. Leather Industries
11. Brick Making Units

12. Other Industries having Thermal Applications
13. Gasifies system in Thermal
14. Textile Units

Characteristics of general bio waste pallet.
Table 2

Calorific values	4000 – 4500 KCal./Kg
Sulphur	White coal free from sulphur Content
Pollution	Pollution free
Fly ash content	2-9% ash content present
Availability	White coal is future fuel, available in plenty
Fuel use in boiler (better heat result/less cost)	Economic and less cost
Storage	Easy to store
Environment	No effect on health
Farmer economy	Making rich to peasant/ local employment

Key Features Of The Briquettes Plant Project

a. High profitability
b. Excellent growth potentiality
c. Ready market
d. Wide variety and easy availability of agro-waste from various crops
e. Short gestation and quick returns
f. Employment potentiality
g. Conversion of natural resources into hi-tech energy and maintenance of ecological balance

Table 3

Fuel type	Heat content kcal/kg
Wood (Wet)	2388
Wood (Dry)	2866

Sawdust Briquettes	4300
Black coal	4770
Natural gas	7640

III. RESULTS AND DISCUSSION

3.1 Calorific Value:

One of the most important characteristics of a fuel is its calorific value, that is the amount of energy per kg it gives off when burnt. The calorific value can thus be used to calculate the competitiveness of a processed fuel in a given market situation. There is a range of other factors, such as ease of handling, burning characteristics etc., which also influence the market value, but calorific value is probably the most important factor and should be recognized when selecting the raw material input

Below we can see heat content chart for mostly used fuels to present.

3.2economical Than Other Fuels

1. It is more economical than others as it possess the following properties.
2. It is cheaper than heavy furnace oil, steam coal fire wood etc.
3. Consistent quality.
4. Low cost as compare to others fuels as well as negligible amount of ash content.
5. Efficient duel ideally sized 90mm diameter and 6 and 12 inch length

IV. FUTURE SCOPE OF WORK:

Our main task is to stop and minimize the carbon emission as far as possible while producing briquettes by blending with some other material in order to save the environment from toxic Sulphur

pollutants. Already the pallets were using in certain industries but our main objective is it doing for the rural areas peoples and for that we are suggesting the applications of this pallet making machine in smokeless chullah. So that the pallets or briquettes will be getting manufactured in an eco-friendly way as well as it burnt with no smoke fumes and it doesn't create any type of pollution in the environment.

V. CONCLUSIONS

The focus of our project is doing something for the farmer's one and to develop such a machine that its design should be simple, efficient .These briquettes can be used in any appliances meant for burning wood or coal. However, certain changes in operating parameters especially the distribution of primary and secondary air will have to be incorporated into the conversion. One should first understand the specific characteristics of briquetted biomass before taking steps to make changes in appliances.

With the help of our project almost simpler design of the machine get reached but still some work is remaining so that we can use utilize maximum benefits from nature. For this purpose we are giving suggestions of using Hydraulic Cylinder instead of Pneumatic cylinder and evaluate the results. Also try to incorporate new mechanism of doing same work. As day by day conventional resources get depleting day by day in such conditions definitely this white coal pallets will proof a Boon For Farmers.

India is the only country where the briquetting sector is growing gradually in spite of some failures. As a result of a few successes and IREDA's promotional efforts, a number of entrepreneurs are confidently investing in biomass briquetting. These entrepreneurs are also making strenuous efforts to improve both the production process and the technology.

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Review Article on Cloud Drops

Dr.Leena Gahane¹ , Ibrahim Abizar Rampurawala² , Chetan Ganesh Mahurkar²

¹Professor , Dpett of Physics , Anjuman College Of Engineering And Technology, Sadar, Nagpur, Maharashtra, India

²BE.II Sem Anjuman College Of Engineering And Technology, Sadar, Nagpur, Maharashtra, India

ABSTRACT

Cloud computing means storing and accessing data and programs over the internet instead of your computer's hard drive.

Drops is division and replication of data in the cloud for optimal performance and security.

Cloud drops is a pervasive awareness platform that integrates virtual information from the web more closely with the contextually rich physical spaces in which we live and work. Clouddrops technology is about securing data over the cloud. Clouddrops consists of many interactive stamp sized displays, each showing a tiny bit of digital information. The large number of displays and their small size allows the user to flexibly instrument, orchestrate and reconfigure her personal information environment. We show different form factors for stamp-sized displays, provide a device concept and a first implementation. Clouddrops represent dynamic digital content, such as websites and documents or contacts. Thereby, each individual content is represented as a separate clouddrop. This allows the user to flexible attach each item on a physical place. In the other direction, it makes a physical place accessible remotely to provide situated messaging and communication.

In the present article we are trying to understand the threats and suggesting new strategy for security aspects.

Keywords : Cloud computing, data, Cloud drops, stamp sized ,security(DATA FRAGMENTATION) , strategy.

I. INTRODUCTION

People intensively use physical space for accessing and remembering paper-bound information. The cloud computing paradigm has reformed the usage and management of the information technology infrastructure. Access to shared resources in a pay-as-you-go mode cuts the management effort of the user to a minimal level. Cloud computing is characterized by on-demand self-services, ubiquitous network accesses, resource pooling, elasticity, and measured services. The aforementioned characteristics of cloud computing make it a striking candidate for businesses, organizations, and individual users for adoption. However, the benefits of low-cost, negligible management (from a users perspective), and greater flexibility come with increased security concerns.

We present Division and Replication of Data in the Cloud for Optimal Performance and Security (DROPS) that judicially fragments user files into pieces and replicates them at strategic locations within the cloud. The division of a file into fragments is performed based on a given user

criteria such that the individual fragments do not contain any meaningful information. Each of the cloud nodes (we use the term node to represent computing, storage, physical, and virtual machines) contains a distinct fragment to increase the data security. However, there is always a possibility of a successful attack on any node. A successful attack on a single node must not reveal the locations of other fragments within the cloud. To keep an attacker uncertain about the locations of the file fragments and to further improve the security, we select the nodes in a manner that they are not adjacent and are at certain distance from each other. The node separation is ensured by the means of the Tcoloring. To improve data retrieval time, the nodes are selected based on the centrality measures that ensure an improved access time. To further improve the retrieval time, we judicially replicate fragments over the nodes that generate the highest read/write requests. The selection of the nodes is performed in two phases. In the first phase, the nodes are selected for the initial placement of the fragments based on the centrality measures. In the second phase, the nodes are selected for replication. The proposed DROPS methodology does not use traditional cryptographic techniques for data security that improves the performance. The working of the DROPS methodology is shown as a high-level work flow in Figure 1.
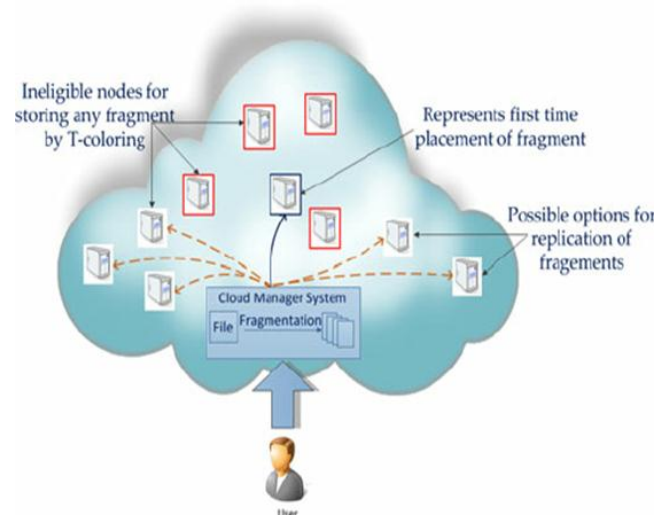
Figure 1. Cloud Drops Methodology

The utilized security procedure should likewise consider the improvement of the information recovery time .Cloud Security Using DROPS (Division and Replication of Data in the Cloud for Optimal Performance and Security) Technique that aggregately approaches the security and performance issues. In the DROPS technique, we separate a document into sections, and duplicate the divided information over the cloud nodes. Security is one of the most crucial aspects among those prohibiting the widespread adoption of cloud computing. Cloud security issues may stem due to the core technology's implementation (virtual machine (VM) escape, session riding, etc.), cloud service offerings (structured query language injection, weak authentication schemes, etc.), and arising from cloud characteristics (data recovery vulnerability, Internet protocol vulnerability, etc.). For a cloud to be secure, all of the participating entities must be secure. In any given system with multiple units, the highest level of the system's security is equal to the security level of the weakest entity. Therefore, in a cloud, the security benefit does not solely depend on an individual's security measures. The neighbouring entities may provide

an opportunity to an attacker to bypass the users defences. The off-site data storage cloud utility requires users to move data in cloud's virtualized and shared environment that may result in various security concerns. Pooling and elasticity of a cloud, allows the physical resources to be shared among many users. Furthermore, the shared resources may be reassigned to other users at some instance of time that may result in data compromise through data recovery methodologies. Furthermore, a multi-tenant virtualized environment may result in a VM to escape the bounds of virtual machine monitor (VMM). The escaped VM can interfere with other VMs may access to unauthorized data. Similarly, cross-tenant virtualized network access may also compromise data privacy and integrity. Due to improper media sanitization can also leak customer's private data.

II. DATA FRAGMENTATION

The security of a large-scale system, such as cloud depends on the security of the system as a whole and the security of individual nodes. A successful intrusion into a single node may have severe consequences, not only for data and applications on the victim node, but also for the other nodes. The data on the victim node may be revealed fully because of the presence of the whole file [17]. A successful intrusion may be a result of some software or administrative vulnerability [17]. In case of homogenous systems, the same flaw can be utilized to target other nodes within the system. The success of an attack on the subsequent nodes will require less effort as compared to the effort on the first node. Comparatively, more effort is required for heterogeneous systems. However, compromising a single file will require the effort to penetrate only a single node. The amount of compromised data can be reduced by making

fragments of a data file and storing them on separate nodes [17], [21]. A successful intrusion on a single or few nodes will only provide access to a portion of data that might not be of any significance. Moreover, if an attacker is uncertain about the locations of the fragments, the probability of finding fragments on all of the nodes is very low. Let us consider a cloud with M nodes and a file with z number of fragments. Let s be the number of successful intrusions on distinct nodes, such that s>z. The probability that s number of victim nodes contain all of the z sites storing the file fragments (represented by P(s,z)) is given as: $P(s, z) = (s \ z)(M – s \ s – z)(M \ s)$. (1) If M = 30, s = 10, and z = 7, then P(10, 7) = 0.0046. However, if we choose M = 50, s = 20, and z = 15, then P(20, 15) = 0.000046. With the increase in M, the probability of a state reduces further. Therefore, we can say that the greater the value of M, the less probable that an attacker will obtain the data file. In cloud systems with thousands of nodes, the probability for an attacker to obtain a considerable amount of data, reduces significantly. However, placing each fragment once in the system will increase the data retrieval time. To improve the data retrieval time, fragments can be replicated in a manner that reduces retrieval time to an extent that does not increase the aforesaid probability.

III. COMPARITIVE TECHNIQUES

When the results of the DROPS methodology are compared with fine-grained replication strategies, namely: (a) DRPA-star, (b) WA-star, (c) A-star, (d) SA1, (e) SA2, (f) SA3, (g) Local Min-Min, (h) Global MinMin, (i) Greedy algorithm, and (j) Genetic Replication Algorithm (GRA). The DRPA-star is a data replication algorithm based on the A-star best-first search algorithm. The DRPA-star starts from the null solution that is called a root node. The

communication cost at each node n is computed as: cost(n) = g(n) + h(n), where g(n) is the path cost for reaching n and h(n) is called the heuristic cost and is the estimate of cost from n to the goal node. The DRPA-star searches all of the solutions of allocating a fragment to a node. The solution that minimizes the cost within the constraints is explored while others are discarded. The selected solution is inserted into a list called the OPEN list. The list is ordered in the ascending order so that the solution with the minimum cost is expanded first. The heuristic used by the DRPAstar is given as h(n) = max(0, (mmk(n)g(n))), where mmk(n) is the least cost replica allocation or the maxmin RC. Readers are encouraged to see the details about DRPA-star in . The WA-Star is a refinement of the DRPA-star that implements a weighted function to evaluate the cost. The function is given as: f(n) = f(n) + h(n) + (1 – (d(n)/D)h(n). The variable d(n) represents the depth of the node n and D denotes the expected depth of the goal node . The A-star is also a variation of the DRPA-star that uses two lists, OPEN and FOCAL. The FOCAL list contains only those nodes from the OPEN list that have f greater than or equal to the lowest f by a factor of 1 + . The node expansion is performed from the FOCAL list instead of the OPEN list. Further details about WAStar and A-star can be found in . The SA1 (suboptimal assignments), SA2, and SA3 are DRPA-star based heuristics. In SA1, at level R or below, only the best successors of node n having the least expansion cost are selected. The SA2 selects the best successors of node n only for the first time when it reaches the depth level R. All other successors are discarded. The SA3 works similar to the SA2, except that the nodes are removed from OPEN list except the one with the lowest cost. Readers are encouraged to read   for further details about SA1, SA2, and SA3. The LMM can be considered as a special case of the bin packing algorithm. The LMM sorts the file fragments based on the RC of the fragments to be stored at a node. The LMM then assigns the fragments in the ascending order. In case of a tie, the file fragment with minimum size is selected for assignment (name local Min-Min is derived from such a policy). The GMM selects the file fragment with global minimum of all the RC associated with a file fragment. In case of a tie, the file fragment is selected at random. The Greedy algorithm first iterates through all of the M cloud nodes to find the best node for allocating a file fragment. The node with the lowest replication cost is selected. The second node for the fragment is selected in the second iteration. However, in the second iteration that node is selected that produces the lowest RC in combination with node already selected. The process is repeated for all of the file fragments. Details of the greedy algorithm can be found in . The GRA consists of chromosomes representing various schemes for storing file fragments over cloud nodes. Every chromosome consists of M genes, each representing a node. Every gene is a N bit string. If the k-th file fragment is to be assigned to S i , then the k-th bit of i-th gene holds the value of one. Genetic algorithms perform the operations of selection, crossover, and mutation. The value for the crossover rate (μc) was selected as 0.9, while for the mutation rate (μm) the value was 0.01. The use of the values for μc and μm is advocated in .The best chromosome represents the solution. GRA utilizes mix and match strategy to reach the solution. More details about GRA can be obtained from.

ADVANTAGES:

- Easy implementation. Cloud hosting allows business to retain the same applications and business processes without having to deal with the backend technicalities. Readily manageable by the Internet, a cloud

infrastructure can be accessed by enterprises easily and quickly.

- Accessibility. Access your data anywhere, anytime. An Internet cloud infrastructure maximizes enterprise productivity and efficiency by ensuring your application is always accessible. This allows for easy collaboration and sharing among users in multiple locations.
- No hardware required. Since everything will be hosted in the cloud, a physical storage center is no longer needed. However, a backup could be worth looking into in the event of a disaster that could leave your company's productivity stagnant.
- Cost per head. Overhead technology costs are kept at a minimum with cloud hosting services, enabling businesses to use the extra time and resources for improving the company infrastructure.
- Flexibility for growth. The cloud is easily scalable so companies can add or subtract resources based on their needs. As companies grow, their system will grow with them.
- Efficient recovery. Cloud computing delivers faster and more accurate retrievals of applications and data. With less downtime, it is the most efficient recovery plan.

DISADVANTAGES:

- No longer in control. When moving services to the cloud, you are handing over your data and information. For companies who have an in-house IT staff, they will be unable to handle issues on their own. However, Stratosphere Networks has a 24/7 live help desk that can rectify any problems immediately.
- May not get all the features. Not all cloud services are the same. Some cloud providers tend to offer limited versions and enable the

most popular features only, so you may not receive every feature or customization you want. Before signing up, make sure you know what your cloud service provider offers.

- Doesn't mean you should do away with servers. You may have fewer servers to handle which means less for your IT staff to handle, but that doesn't mean you can let go of all your servers and staff. While it may seem costly to have data centers and a cloud infrastructure, redundancy is key for backup and recovery.
- No Redundancy. A cloud server is not redundant nor is it backed up. As technology may fail here and there, avoid getting burned by purchasing a redundancy plan. Although it is an extra cost, in most cases it will be well worth it.
- Bandwidth issues. For ideal performance, clients have to plan accordingly and not pack large amounts of servers and storage devices into a small set of data centers.

PRESENT THREATS

- The neighboring entity may provide an opportunity to an attacker to bypass the user defenses.
- The off site data storage cloud utility requires users to move data in clouds visualization and shared environment that may cause various security concerns.
- Pooling and elasticity of the cloud, allow the physical resources to be shared among many users. These shared resources may be reassigned to other users for some instance of time that may result in data compromise.
- A multi tenant virtual environment may result in VM to escape the boundaries of virtual machine monitor(VMM) which can

interfere to other VMs may access to unauthorized data.

- In cross tenant virtualized network, due to improper media sanitization, the customer data can also get leaked.

PRESENT STRATEGIES USED TO DEAL WITH THREATS (PRESENT)

- In the DROPS methodology, a file is divided into fragments, and replicate the fragmented data over the cloud nodes, which is duplicating the data. Each of the nodes stores only a single fragment of a particular data file that ensures that even in the case of a successful attack, no meaningful information is revealed to the attacker.
- The nodes storing the fragments are separated by a certain distance by means of graph T-coloring to prohibit an attacker of guessing the locations of the fragments.
- For a cloud to be secure all participating entities must be secure. In a system with multiple units, the highest level of systems security is equal to the security level of the weakest entity.

UNIDENTIFIED PREVAILING THREATS (AS STUDIED AFTER REVIEWING THE ARTICLE)

- If user id and password for the cloud account is hacked our data stored in public cloud is at high risk.
- If the servers of the company providing cloud storage are hacked all the individual data with the company lies under risk of miss use against individual as well as company.
- In case of war, if our data lies with a company of a country with which our country is at war our data may be compromised or misused by the nation with which we are at a war. In such case our personal data can act as a weapon against our nation.

SUGGESTED STRATEGIES

- Data stored over cloud must be secured with biometric password (like: fingerprint, iris scan, etc) so that it reduces or nullify the risk of data from being hacked.
- Companies providing cloud data storage service must have a very strong firewall against hackers and should consider the security against hacking of utmost importance.
- Data storage servers must be contented within the same country where the user of the cloud presides and there must be a government body which can take over the data from the foreign company providing cloud facility in case of any emergency.

IV. CONCLUSION

We studied about cloud drops technology and threats with which it is fighting with the help of fragmentation and came up with future or unidentified threats which are still present even after utilization of the present technology and its strategies.

We also came up with some strategies which could be used against the threats still prevalent.

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"A Review on Real Time Tracking and Face Recognition System"

Anam Darakhshan Saify Khan[1], Mohammad Nasiruddin[2]
[1]Student, Electronics and Communication, RTMNU, ACET, Nagpur, Maharashtra, India
[2]Associate Professor & HOD, Electronics and Communication, RTMNU, ACET, Nagpur, Maharashtra, India

ABSTRACT

This review summarizes the current state of research work made in the field of Real Time face recognition. In order to address all current face recognition researches, it include approaches that uses Blobs Acquisition and Segmentation as well as those uses Kalman Filter, Viola-Jones algorithm, Variation-ratio gain(VRG), Principle component analysis (PCA) Face recognition algorithm. This paper is a survey of various novel algorithm for different methods of feature extraction used by renowned personals. It gives a review on current research works where algorithm for face recognition typically extract facial features and compare them to a database to find the best match.

Keywords: Video Surveillance Cameras, Face Database, Face Recognition.

I. INTRODUCTION

Interest in face recognition, as a combination of pattern recognition and image analysis is still growing. Many papers are written and many real-world systems are being developed and distributed. As a non-invasive biometric method, face recognition is attractive for national security purposes as well as for smaller scale surveillance systems. However, in order to be able to claim that any face recognition system is efficient, robust and reliable, it must undergo rigorous testing and verification, preferably on real-world datasets.

The first thing need to create a face recognition system is a database of facial image of people that want to recognize also known as face gallery. Then perform a processing step known as feature extraction to store discriminative information about each face in compact feature vector. Following this we have to fit a model of the appearance of faces in the gallery so that we can determine between faces of different people in database the output of this stage is the classifier or a model that is used to recognize input images.

When we have input query image a face detection algorithm is used to find where the face is allocated in that image. We then crop, resize and normalize the face to match the size and pose of the image used in the training face gallery. Then performed the same feature extraction step that we did with the face gallery and run that through classifier or a model. The output is the label or an indicator to signify which person from the database the query image belongs to.
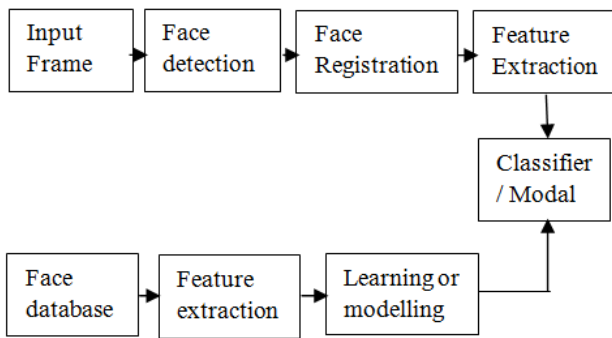
Figure 1. Face Recognition Workflow

II. VIDEO CAMERA SURVEILLANCE:

Real time people flow estimation can be very useful information for several applications like security or people management such as pedestrian traffic management or tourists flow estimation. The use of video camera to track and count people increase considerably in past few years due to the advancement of image processing algorithms and computers' technology. Several attempts have been made to track people but all those different ways can be classify in three categories of different complexity:

- ✓ Methods using region tracking features. To improve this methods some adding a classification scheme of pixel based on color or textures.
- ✓ Methods using 2D appearance of humans (using different models of humans)
- ✓ Methods using multiple cameras to make full 3D modelling.

The third category is more accurate than the two others because it rebuild precisely the scene (so it deals in a better way the occlusion problems) but it is also the most difficult with complex algorithms. Sometimes, this system required a complex camera set-up (calibration) and cannot operate in real-time because the 3D models are too slow. This is why most of the system used the other two categories.

In the paper [1], a novel approach is present to count number of people that pass through the view of an overhead mounted camera. Moving people are first detected as blobs and presented by binary masks, based on which possible multi-person blobs are further segmented into isolated persons according to their areas and locations. Each single person is tracked through consecutive frames using a correlation-based algorithm and a state diagram is proposed to count people entering and leaving the scene. Vision-based approaches are usually employed to accomplish this task, however, occlusion among people becomes a large obstacle when traffic is heavy. It solve the problem by placing a camera overhead to face downward, has been done by author Kim and Chen. Kim use convex hull approximation and velocity information to track and count people. Chen make use of HSI histogram information to track each person. They also use bounding-box algorithm to handle merge-splitting problems.

In this approach, blobs in current frame are firstly detected as groups of changed pixels using background subtraction. Define *New* blobs as blobs that just occur in current frame, and *Old* blobs as those also present in previous frame. Lost and Found algorithm is introduced to obtain the two types of blobs. As some of them may involve multiple persons, thus it propose a binary-level area-based segmentation scheme to ensure that each blob represents only one person. It then apply a correlation-based tracking method to establish correspondence between persons in two successive frames. Moreover, to facilitate bi-directional counting, the camera view is divided into three areas. Creative WebCam NX Ultra was used in our

experiments. It was placed 2.3 meters above the ground. The system has been tested on an Intel Pentium IV 2.4GHz PC with MatLab 6.5. The system achieved 100% accuracy at 3 fps. Neither false detection nor uncounted person events occurred in our experiment. One limitation of our system is that when more than four people join into a blob they are hard to be properly segmented.

In paper [2], a system is described a system for real time tracking of people in the video sequences. The input to the image is live or recorded video data acquired by a stationary camera in an environment where the primary moving objects are people. The output consist of trajectories which gives the Spatio-temporal coordinates of individual.

A system is developed for the interpretation of moving light displays (MLDs). Here, the objective is to segment out points from MLDs images of moving people into sets of corresponding to individual people and register different points on a person with different body parts. Individuals points are tracked across frames and points in each frame are clustered into individual objects based on their position and velocity. The motion field in each frame is obtained by matching intensity features in successive frames. The motion field is smoothed both temporally and spatially and then split into regions having the same quantized direction of motion. The posture of the person in each frame is estimated by matching gray scale edge the image with model edges. Figure shows main steps in people tracking system.
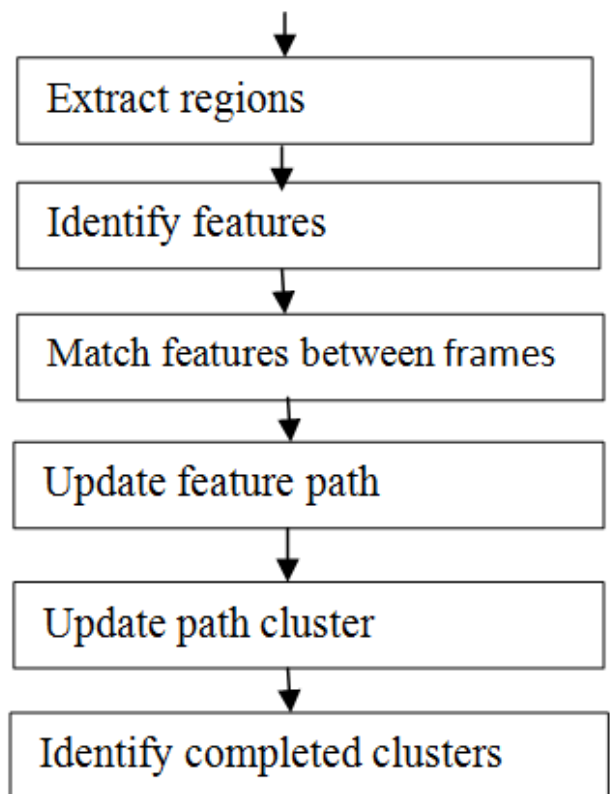
Figure 2. Steps in people tracking system

An application for counting people through camera is discussed in paper [3]; it performs the count distinction between input and output of people moving through the supervised area. The counter requires two steps: detection and tracking. The detection is based on finding people's heads through pre-processed image correlation with several circular patterns. Tracking is made through the application of a Kalman filter to determine the trajectory of the candidates. Finally, the system updates the counters based on the direction of the trajectories.

Here people counting is performed by extracting an appearance vector based on a color region of interest (ROI) and a probabilistic model, using the stereoscopic disparity map to resolve possible uncertainties. Two ROIs are defined at the top and bottom of the image. Next, the column histogram of

the optical flow is computed in those areas. The number of people crossing the area is obtained from the histogram values considering a minimum threshold. The count is obtained from the information of blobs crossing the ROIs.

For proper operation of system, a background image is dynamically updated to slowly capture small changes in scene illumination and introduce new static object. The background modelling has been divided into two parts; a comparison phase to obtain min/max value of each image pixel and the update phase. In comparison phase, the original image is compared pixel by pixel with one image containing the max value I_{max} and another with min value I_{min}. If original image pixel i.e. I(m,n) is greater then corresponding pixel from I_{max}(m,n) then pixel value of maximum image is modified with the image value see Eq.1 and Eq. 2 respectively.

$$vm(m, n) = [Imax(m, n) - Imin(m, n)]/2 \qquad (1)$$
$$Backupdate(m, n) = \alpha Back(m, n) + (1-\alpha)vm(m, n) \quad (2)$$

Where parameter α determines the influence of the previous background value Back(m, n) and a new value $vm(m, n)$.

In the case of people tracking, the capture rate of the camera (in frames per second) should be sufficient to capture individually movements a number of consecutive times so that the estimation process may be consider linear in time. The aim of this technique is to obtain a good model to follow an object at each instant of time through an analysis of state variables.

Kalman filter used to estimate the orientation of the tool and the position of the center of the tool. Use of Kalman filter is combined with the information from a 2D stochastic model in order to identify the shape of person within image. The Kalman filter is a recursive procedure consisting of two main stages; prediction and correction. The first stage aim to estimate the motion, while the second is responsible for correcting the error in the motion. The key point is the feedback between the cracking and detection stages, allowing a more robust algorithm to be achieved, resolving temporal errors and partial occlusion that could occur in real image sequences such as the test videos used.

R. Venkatesh and A. Balaji Ganesh proposed research work and developed a real time system on moving object and face recognition using MATLAB. This paper [4]; implements a method to track and recognize the object in a surveillance area. They analyze usual pixel-approach. Camera system (webcam) acts as a sensor to track the object in surveillance area. Edge detection is an image segmentation process is implemented to have clear knowledge on real edges of real time video. Background separation algorithm provides clear knowledge about foreground and background. Video pre-processing such as frame separation, thresholding, binary operation, histogram equalization and edge detection of traffic video is done to track multiple objects and recognize it. Stepper motor may be used to orient the camera to any position to track and recognize object in surveillance. Contour let transform is used for feature extraction to recognize the object in a surveillance area and pattern matching also play an important role to recognize different objects in a video.

Two or more frames acquired at different time contain the information about relative motion between an imaging system and a scene. Therefore, the information about motions can be obtained through analysis and processing of frames acquired

at different time. Video sequence analysis methods can be classified into three methods: optical flow method, background difference method and adjacent frame difference method. Optical flow method reflects the frame variation caused by motion in a definite time interval. The motion field of frames is estimated to incorporate similar motion vectors into moving object solving transcendental equations is required in optical flow method. Background difference method is a technique for detecting the motion area by making the difference between the current frame and the background frame. An image is divided into foreground and background in this method. The background is modelled, and the current frame and the background model are compared pixel by pixel. Those pixels accordance with the background model are labeled as the background, while others are labeled as the foreground. In adjacent frame difference method, moving objects are extracted according to the differences among two or three continuous frames.

In order to acquire image using MATLAB, a video input object which represents the connection between MATLAB and the image acquisition device (in this case camera), must be created first. Video analysis normally requires certain video processing algorithm to prepare the image for further analysis. For this work, the video is analysed as it is viewed. To analyze color frames, it is necessary to first segment it. Edge detection is one of the most commonly used image segmentation methods in object detection. Since edges contain some of the most useful information in an image can be used to extract boundaries of each different object in an image.

Many edge detection algorithm have been developed which include Sobel, Prewitt, Roberts,

Laplacian of a Gaussian, zero crossing and canny edge detectors, was used because of the fact that it is less susceptible to noises in comparison to other edge detection methods. The algorithm can be summarized as follows;

1. First the image was smoothed using a Gaussian filter with a specified standard deviation in order to reduce noises

2. Standard first-order edge detection was performed to find the edge locations and edge directions. An edge point will be the point whose strength is locally maximum in the direction of the gradient.

3. After this, non-maximum suppression will be applied. Non –maximum suppression is used to trace along the edge in the edge direction and suppress any pixel values (set to 0) that are not considered to be an edge. This will give a thin line in the output image.

4. Finally, Hysteresis thresholding was performed using two threshold values, T1 and T2 with T1<T2. Any result pixel with a value greater than T2 is categorized as a strong edge pixel, whist result pixel with value between the two threshold and adjacent to the strong edge pixel will be considered as weak edge pixel.

A primary objective of paper [5]; is the field trialing and ongoing development of a system for the robust detection and identification of persons of interest in a crowd. These people will often have non-frontal facial presentation, be photographed under various lighting conditions, and will exhibit natural expressions such images are typically acquired from CCTV cameras in public spaces as the subjects are not usually aware of camera placement. Other capabilities that are being trialed and developed include

1) Robust detection of background changes,
2) Tracking and identification of people by their appearance across multiple cameras,
3) Detecting suspicious events such as left luggage or the dangerous behavior of people,
4) Video summarization to produce brief video summaries of activity.

In this paper, the configuration of the trial system and some early results from commercial and NICTA research systems is presented. It also discuss the implementation and scalability challenges, as well as issues related to on-going real life trials in public spaces using existing surveillance hardware. The main capabilities that are currently offered by leading Intelligent Surveillance software vendors are demonstrated. Technology gaps are identified and opportunities for computer vision and pattern recognition research in the field of ICCTV are discussed. The main stages of processing in an intelligent visual surveillance system are: moving object detection and recognition, tracking, behavioral analysis and retrieval. These stages involve the topics of machine vision, pattern analysis, artificial intelligence and data management.

III. FACE RECOGNITION:

Face detection algorithms are usually divided into two general categories: (i) feature-based and (ii) learning-based methods. The algorithms from the first category are based on the assumption that face in the image can be detected based on some simple features, independent of ambient light, face rotation and pose. Thus, a simple method uses image projection to detect faces under the assumption that the background is uniform and with the vertical projection of the grey level image is determined the face position. Another feature-based face detection approach is based on a skin colour model determined by using the probability distribution in a colour space. The face is detected in image by applying a threshold on the modelled distribution. The algorithms from the second category are more robust but they need a greater computational effort. Learning-based methods use a number of training samples and benefit from statistical models and machine learning algorithms.

The detection of faces in an image is a subject often studied in computer vision literature. The algorithm which allowed face detection, imposing new standards in this area, was the Viola – Jones algorithm. In the paper [7], a practical implementation of a face detector based on Viola-Jones algorithm using Matlab cascade object detector is presented. Employing the system type object *vision Cascade Object Detector*, eight face detectors were developed using the *train Cascade Object Detector* function and tuning the number of cascade layer and the False Alarm Rate. For different tuning parameters, the performances of the face detectors were analysed.

The Viola – Jones algorithm is intended for real – time detection of faces from an image. Its real – time performance is obtained by using Haar type features, computed rapidly by using integral images, feature selection using the AdaBoost algorithm (Adaptive Boost) and face detection with attentional cascade.

The Viola-Jones face detector can run in real time because it is based on the following main ideas:
-Rapid computation of Haar-like features using the integral image;
- Classifier learning with AdaBoost to select the best feature;

- The attentional cascade structure which rejects the majority of the sub-windows in early layers of the detector, making the detection process extremely efficient.

Due to the simplicity of extracted features process and selection of the best features, Viola-Jones face detector is fast and robust, being reported many and various implementations for different applications.

Another paper written by Brian C. Lovell, Shaokang Chen and Ting Shan [8]; defines main approaches for face detection as feature based, image based, and template matching.

Feature based approaches attempt to utilize some priori knowledge of human face characteristics and detect those representative features such as edges, texture, colour or motion. It is shown in Fig. 3 where feature based, template matching & image based are main Face Detection Techniques. Edge detection is a necessary first step for edge representation. Two edge operators that are commonly used are the Sobel Operator and Marr-Hildreth operator. Edge features can be easily detected with a very short time but are not robust for face detection in complex environments. While texture based approach propose by detecting local facial features such as pupils, lips and eyebrows based on an observation that they are normally darker than the regions around them. Color feature based face detection is derived from the fact that the skin color of different humans (even from different races) cluster very closely. Various face detection techniques are present here:
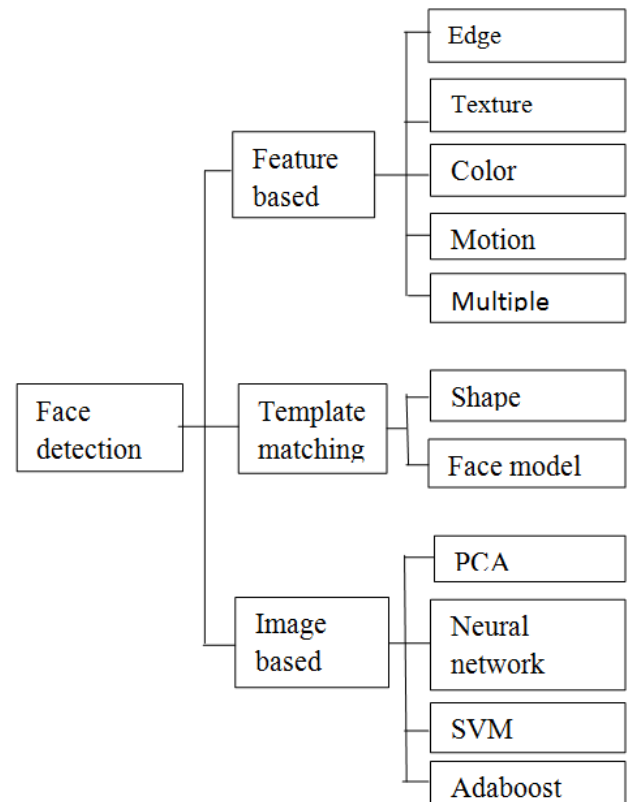
Figure 3. Face Detection Techniques

The Template matching approach is further divided into two classes: Feature searching and Face models. Feature searching techniques first detect the prominent facial features, such as eyes, nose, mouth, and then use knowledge of face geometry to verify the existence of a face by searching for less prominent facial features. Image-based approaches treat face detection as a two class pattern recognition problem and avoid using *a priori* face knowledge. It uses positive and negative samples to train a face/non-face classifier.

In summary, there are many varieties of face detection methods and to choose a suitable method is heavily application dependent. Figure 2 shows various face detection techniques and their categories. Generally speaking, feature-based

methods are often used in real-time systems when color, motion, or texture information is available. Template matching and image-based approach can attain superior detection performance than feature-based method, but most of the algorithms are computationally expensive and are difficult to apply in a real-time system.

IV. APPLICATION AND FUTURE SCOPE

Among the different biometric techniques, face recognition may not be most reliable and efficient. However one key advantage is that it does not require the cooperation of the test subject to work. Properly designed system installed in airport, multiplexes and other public places can identify individual among the crowd, without passerby even being aware of the system. Automated face recognition can be applied 'live' to search for a watch-list of 'interesting' people, or after the fact using surveillance footage of a crime to search through a database of suspects. Other biometric like fingerprints, iris scan and speech recognition cannot perform this kind of identification.

V. CONCLUSION

In this paper, we have given an introductory survey for the face recognition technology. Face recognition is a both challenging and important recognition technique. Among all the biometric techniques, face recognition approach possesses one great advantage, which is its user-friendliness (or non-intrusiveness). Different video camera surveillance and face recognition techniques have been studied to make system efficient and work on real time with more efficient result.

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E-Forum for Professional Colleges Using Android

Vaibhav Choudhari¹, Tejas Meshram¹, Saurabh Mankar¹, Pranay Amle¹, Mrs. Vani Bhogadhi²

¹Department of Information Technology Kavikulguru Institute Of Technology And Science ,Ramtek, Nagpur, Maharashtra, India

²Asst. Prof, Department of Information Technology, Kavikulguru Institute Of Technology And Science ,Ramtek, Ramtek, Nagpur, Maharashtra, India

ABSTRACT

In most of the educational institutions, the only way to communicate with students regarding the activities conducted by the forum of various departments is only through departments' notice board. If the student wishes to participate, they need to find the concerned person manually. The relevant documents need to be maintained in a file. The solution to the above problem is the "E-Forum Android Application". This application helps the administrators to upload the notices regarding the forum activities. This system helps the students to view the details about the activities of the various departmental forums and also register themselves to participate in the activities. This client-server architecture enables the delivery of information to individual student on their mobile devices which can be accessed anywhere and anytime. This keeps students informed.

Keywords: Client-Server, E-Forum Android Application, Administrators.

I. INTRODUCTION

Now a days Android is the operating system which is mostly used in the smartphones. Near about 80% people are using the smartphones which is based on Android Operating System. With the help of Google App Market, it is very easy to spread the applications among the people. Android Studio (Android Application Development Tool) provides the user friendly platform to develop android application. This is the reason behind selecting the platform for the proposed application is Android.

E-Forum App helps the user to access online notices as well as information about all the forums in the college. It is an online notice board where a group of people can easily communicate with each other by accessing virtual notices. E-Forum application provides information in the form of text and images.

The notice board has always been the place where staff/students gather to get their latest release of institutional news. E-notice in this E-Forum application brings the notice board to a virtual location where students/staff can not only read notices but also immediately react and response to them from their own mobiles. In E-Forum and E-notice (Announcement System) information alerts may be sent to the opted staff/students that new notices are available.

A. Purpose

The purpose is to design an Android Application which contains the digital notice board, that should improve the pre-existing college notice board of various departments.

B. Objectives:

· To develop an application which brings the notice board to a virtual location where students can access it easily.

· To develop highly efficient application as it keep the students aware through notices about forums.

· To make the student able to do online registration to participate in any activity organized by forums.

C. Organization of the paper:

The content of this paper as follows: In Section II provides Literature survey, Section III covers the details of the proposed work, Section IV presents Experimental results and discussion and in Section V Conclusion is presented.

II. LITERATURE SURVEY

This is the era of modern technology where people have their own smart phones for their daily use. In every institute there is nothing for advertising or spreading the news about the activities conducted by the forum. They have only one way that is notice board [1] of departments. Most of the students don't have the habit to see the notice board. In many educational institutes, to maintain notices or other any forum details they maintained it in a file by keeping hard copy of relevant document. These also results into copious use of the paper [2], affecting the environment adversely.

Some the of colleges use e-notice boards [3] to display about current events but there is nothing to get information about the forums present in the colleges and e-notice boards used by those colleges are only for the purpose of display notices. There we cannot store the information about any forum or anything related to the forums. There is also the problem of limited spacing to display the notices. Because of this many students don't know about events organized by the forums and are unable to participate in those events.

This is the problem with the pre-existing system i.e. e-notice board. The solution to the above problem is the application "E-Forum for the Professional Colleges ".With the help of this application students can get the details about the forums present in the colleges and students will also know what actually going on. This will also results in reduction in copious use of the paper, which is affecting the environment adversely. With the help of this application students will get details about all the forums present in the college and the events which will be organized by the forums.

In this application we will provide separate login IDs to staff-incharge of every forum so that only he/she will be able to update the status of their respective forums. If the students want to participate in any forum activity they register their names online to participate in that activity.

III. PROPOSED SYSTEM

There is lots of information required in the education institution but we are concentrating on Colleges Forum Activities using Android, as it is very essential in day to day life in academic. In our proposed system there are two phases, Admin and Student. The admin for this "E-Forum" application are president, vice-president, secretary and joint-secretary of the respected forums. They can upload the notices related to the forum activities.

Registration form is provided for new users. Existing users (students) can register online for any events conducted by forums.

The proposed system is easy to use, it keeps all notices, needs less memory space, no need for

looking college notice board for checking any forum events, create the awareness of permissions to the user.

D. Proposed System Architecture
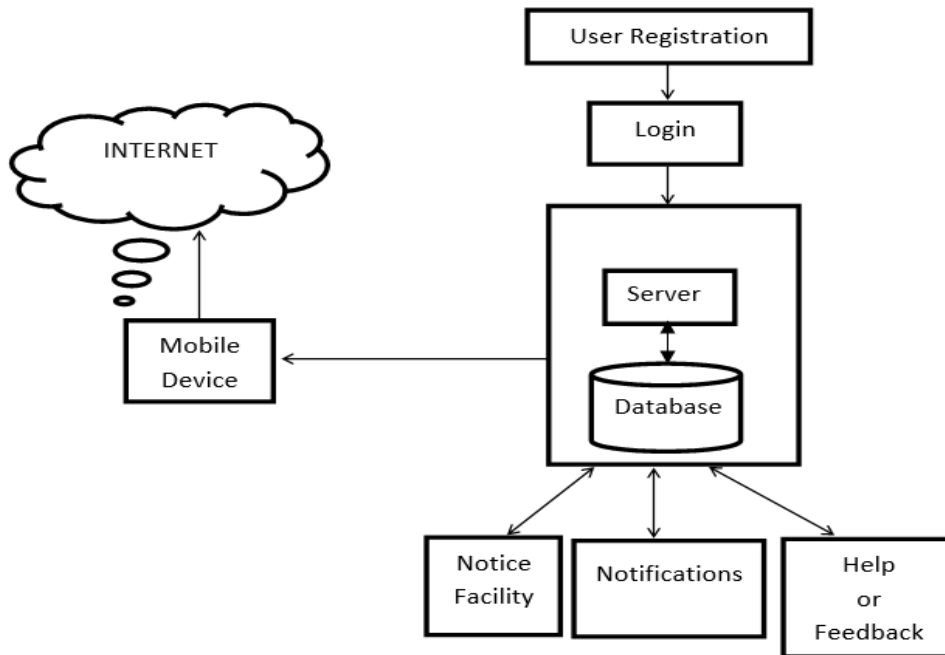
Figure 1(a). Proposed System Architecture for E-Forum

E. Sequence Diagram
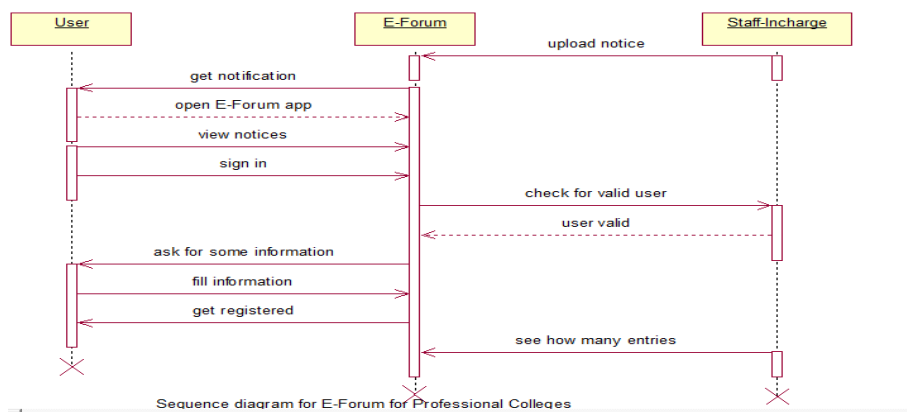
Figure 1(b). Sequence diagram for E-Forum Application for Professional Colleges

IV. EXPERIMENTAL RESULTS AND DISCUSSION

Figure 1(c). Menu page for E-forum Application

Figure 1(d). Login page for E-forum Application

Figure 1(e). Upload notice page for E-forum Application

V. CONCLUSION

The deployment of our E-FORUM android application brings an advanced means of passing notices around college campus. It has capability of disseminating notice in a well-organized manner compared to the existing paper-based notice board system. In addition, people will be able to view multiple posted notices and also get registered for any events conducted by the forum at anytime and anywhere. Security of the notice is guaranteed as the admin and the faculty posting notices have an authorization to do so. The output can be displayed on android mobile phones, tablet computers and other android devices. In this application the student is the main priority. Ever feature added in this application is keeping in mind the needs of the students and the main aim to provide the users services in an efficient and user-friendly manner.

In general, the e-forum will result as an improvement over existing notice board used in college campus.

Requirement and ample opportunity, behind this project renders it necessary for a system of this kind to be developed. On the move, people are able to access requisite information and capture immediately any important information at any time. The promise is to ensure timely and accurate information flow to the users.

VI. AKNOWLEDGEMENT

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"Electric Power Generation by Using Roof Top Ventilator"

**Alisha Moon, Payal Chaurase, Prachi Khekale, Mayuri Wagh, Devyani Chahande, Komal Gadhave,
Pooja Panpude, Aachal Wandile**

Department of Electrical Engineering, Smt. Rajshree Mulak College of Engineering For Women, Great nag road
Nagpur, Maharashtra, India

ABSTRACT

The modified roof ventilator that can generate electricity. The new modification of the roof ventilator system is by adding the extra fins to help it to spin faster and more efficient. Optimum design and performance of the system also discussed. This system is suitable to use for the low speed wind places. The system is containing the combination of the DC generator, roof ventilator, battery charger, and inverter. This system managed to produce 13V DC to 14V DC to charge the 12V DC batteries system. The operational concept of the system is the load will use the energy from the battery that charged using roof ventilator. The observed performances of system are the voltage and current of the roof ventilator, battery and the load.

Keywords : Roof top ventilators , electric generator, wind energy.

I. INTRODUCTION

Wind energy is one types of renewable energy and it does not cause pollution. Therefore, presently, there is the technological development of applying wind energy for the electricity generation. Wind energy is used to replace fossil energy such as oil and coal, causing environmental pollution. In Auditoriums, Theaters, work places, etc. there were number of peoples gather, together due to this warm atmosphere gets form. This warm air is lighter than cold air, so it goes upward towards roof and gets thrown out in atmosphere through roof ventilators. This warm air is a natural source provided by human being. The ventilator sucks the warm air in the building and throws it to the outside of the building, then the inside building temperature and humidity are not too high.

Now-a-days, the world is talking about the green energy that can save the world from pollutions and green house effects. The main function of the free spinning roof ventilator is to provide fresh air in roof space and living area all year round 24 hours a day free of charge. The additional function of this project is to produce the electrical energy from the roof ventilator that will spin. The new idea of the additional fins is helps to improve the ventilator speed and electrical production.

Block diagram
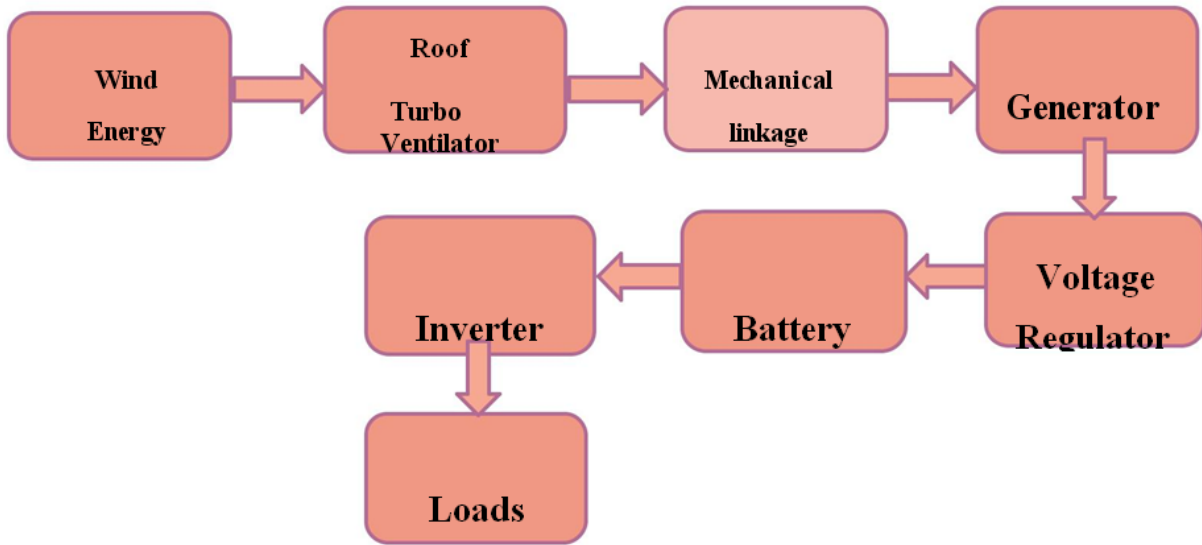
Figure 1. Block diagram of electrical power generation by using RTV

working diagram and principle :
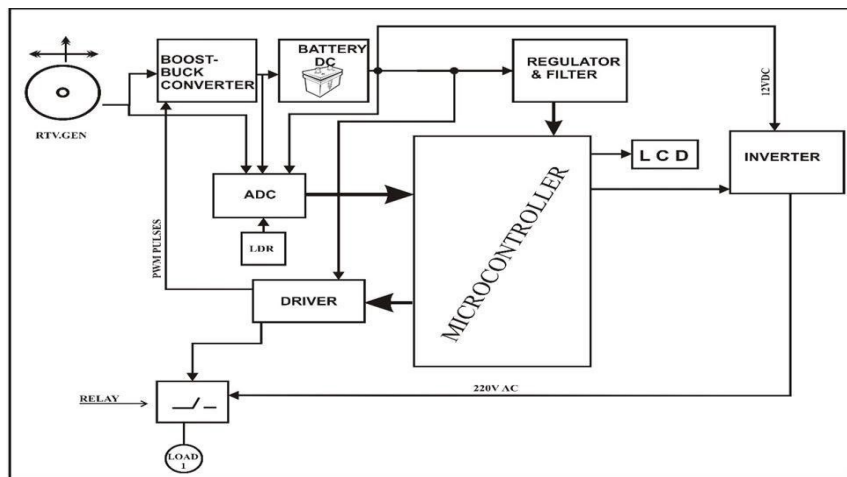
Figure 2. Working diagram of electrical power generation by using RTV.

- The presence of wind in industry, house, theaters etc. will sufficient to rotate the RTV. This RTV will be rotate the generator. This generator will generate some amount of voltage.
- The battery we used is 12v & the requirement of battery is constant i.e.12v.

- How to identify the boost/buck conversion?
- Battery is less than 12v then boost conversion are used.
- Battery is high than 12v then buck conversion are used

- ADC converter through battery will charged sufficiently or not will also check, that's why we check the battery output.
- What is ADC converter?

In our project, we read the three voltages by ADC convertor i.e. 1)Generator voltage

2)Buck/Boost voltage
3)Battery voltage.

• Microcontroller is used for some conditions to be checked & performed. The controller is worked on the some amount of voltage & it will also required to the some amount of constant voltage. Microcontroller will be confirmed that ADC converter will checked the voltage levels & that time we seen or we decided is battery sufficiently charged or not. If the battery will not charged then we performed buck/boost operation / conversion.

• Inverter has convert 12v DC through 220v AC & it goes through switching relay to load. Load will be any kind of load. Ex. Charger, bulb etc.

• Switching relay used because, suppose the voltage is less than 12v DC then the inverter output is also less than 220v AC & that time switching relay will off & the voltage is constant the switching relay will ON.

• So, for to operated the switching relay we used driver circuit. Driver circuit is nothing but the voltage amplifier circuit. This circuit will convert the output of micro-controller to 12v for to operate the switching relay.

II. CALCULATION – SELECTION PROCEDURE

Determine Volume of space to be ventilated
Volume (ft3)+ L x W x H,
Where L+ Length, W= width, H=Ht. of building
Select air changes per hour inside working area from table
A Calculate required ventilation rate Q (cfm)
Q(cfm)= Volume (ft3) x Air change Rate/ 60
Determine number of ventilators = Ventilation Rate Q/ Exhaust Capacity

Example:
Building dimensions with L=100ft,W=60ft,H=20ft.
Volume (ft3)=120000 ft3.
Air change rate selected =12 times per hour.(from Table-A)
Calculations required ventilation rate Q(cfm)
Q(cmf)= volume (ft3) x air change rate
Ventilation rate Q(cfm) = 120000x12 = 24000 cfm/60
Refer table B,select suitable table model from table is wind-e 22" Exhaust capacity = 1084, 1 ventilator per hour.

Under wind velocity of 5mph,temp. diff. of 5 degrees, stack height =20 ft. Air turbine ventilators required quantity = 24000 cfm / 1084 =22 Nos. Selection is 22 Nos. of wind-e 22"

Table 1. Recommended Air changes rates

Typing of building	Air change per hour	Typing of Building	Air change per hour
Assly Hall	6-12	Factories(Heavy)	10-30
Auditorium	4-12	Laundry	12-30
Bakeries	12-20	Paper Mill	8-30
Boiler Room	15-60	Textile Mills	4-12
Brewery	8-30	Packing Room	8-30
Class Room	10-15	Transformer Room	12-30
Engine Room	12-30	Paint Shops	10-30
Factories(Light)	6-12	Warehouse	4-6

Table 2. Performance Data

Wind Velocity(Mph)			5			8			10		
Temp. Diff. °C			3	5	10	3	5	10	3	5	10
Model No.	Throat size (inc)	Stack height	Exhaust Capacity in cfm								
Wind-e	22	10	939	1000	1102	1436	1498	1600	1792	1854	1958
		20	1005	1084	1216	1503	1582	1714	1859	1938	2070
		30	1058	1154	1314	1556	1652	1812	1915	2010	2168
		40	1107	1216	1398	1605	1714	1896	1961	2070	2252

III. ACKNOWLEDGEMENT:

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"Interactive College Enquiry Using Bot"

Aditya. Setiya[1], Mohd. Danish[1], Shaila.Khan[1], Mohd. Tufail[1], Prof. Imteyaz Shahzad[2]

[1]Department of computer sci & Engg Anjuman College of Engg & Tech Nagpur, Maharashtra, India

[2]Department of Computer Sci. & Engg. Anjuman College of Engg & Tech , Nagpur
Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, Maharashtra, India

ABSTRACT

Chat bots typically provide a text based user interface, allowing the user to type commands and receive text as well as text to speech response. Chat bots are usually stately services, remembering previous commands in order to provide functionally. When chat bot technology is integrated with popular web services it can be utilized securely by an even larger audience. User interfaces for software applications can come in a variety of formats, ranging from command-line graphical, web application, and even voice. While the most popular user interfaces include graphical and web-based applications, occasionally the need arises for an alternative interface. The college enquiry chat bot will be built using artificial algorithms that analyzes users query understand users message. This System will be a web application which provides answers very rapidly. Students just have to place their query to the bot which is used for chatting. The system will use the artificial intelligence algorithms to give appropriate answers to the user. If the answer is found invalid, then some system to declare the answer as invalid can be integrated. These invalid answers can be revised by the admin of the system. There is no need to go to college for enquiring regarding college.

Keywords: chat-bot, chatter-bot, pattern matching, keyword matching.

I. INTRODUCTION

A chat bot (also known as a talk bot, Bot, chatterbox, Artificial Conversational Entity) is a computer program which hold a conversation via auditory or textual methods. Chat bot that runs a automated task over the internet Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, Chat bots are typically used in dialog system for various practical purposes including customer service Chat bots are often integrated into the dialog systems of for example small talking

unrelated to the scopes of their primary expert system. College enquiry chat bot response the query on the basis of artificial intelligence. The student will get the proper answer as per the query. The answer of the query will be based on the artificial intelligence algorithms. Students won't visit to college to collect the enquiry. The system replies using an effective graphical user interface which implies that as if a real human is talking to the user. The user has to register him to the various helping pages through which user can asked the query effectively. The user can ask the query related activities like date, timing, annual day of the

college, sports day, department activity, and other cultural activities.

II. LITERATURE REVIEW

A.L.I.C.E(Artificial Linguistic Internet Computer Entity)

A.L.I.C.E (Artificial Linguistic Internet Computer Entity) is an award winning open source natural language artificial intelligence chat robot which utilizes AIML (Artificial Intelligence Markup Language) to form responses of queries. But it is just simple XML.AIML is an XML based markup language meant to create artificial intelligent applications. AIML makes it possible to create human interfaces while keeping the implementation simple to program easy to understand and highly maintainable. AIML was developed by the Alice-bot free software community and Dr. Richard S. Wallace during 1995-2000. AIML is used to create or customize Alice-bot which is a chat-box application based on A.L.I.C.E. (Artificial Linguistic Internet Computer Entity) free software. There are several chat-bots are available used for many purposes. But there is no chat-bot are available for making college enquiry. The purpose of a chat-bot system is to simulate a human conversation the chat-bot architecture integrates a language model and computational algorithm to emulate information chat communication between a human user and computer using natural language. With the improvement of data-mining and machine-learning techniques, better decision-making capabilities, availability of corpora, robust linguistic annotations/processing tools standards like XML and its applications, chat-bot have become more practical in daily life applications such as help desk tools, information retrieval tools, automatic telephone answering systems, advertising, tools to

aid in education, business and E-commerce. In E-commerce, chat bot helps in information retrieval tasks, such as for searching and browsing, as menu based navigation poses difficulties in locating the appropriate information. The dialogue system provides additional information on products and simplify decision making process to find a product that satisfy customer's requirements. The study focused more on user attitudes rather than on chat-bot efficiency.

III. DESGN

Designing is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. Systems design could be seen as the application of systems theory to product development. There is some overlap with the disciplines of systems analysis, systems architecture and systems engineering. The college enquiry chat bot will take the query from the user and will give the appropriate answer to the user query. The user can even mark the answer given by system as invalid, if he/she finds that the answer is not relevant to the query. The user will just have to visit the web page of chat bot and interact with the bot to get the answers to their query.

MODULES

- ✓ Implementation of Complete Framework (all form Design)
- ✓ Knowledgebase creation for Chabot
- ✓ Integration and Connectivity.

Figure 1. Home Screen   **Figure 2.** Active chat
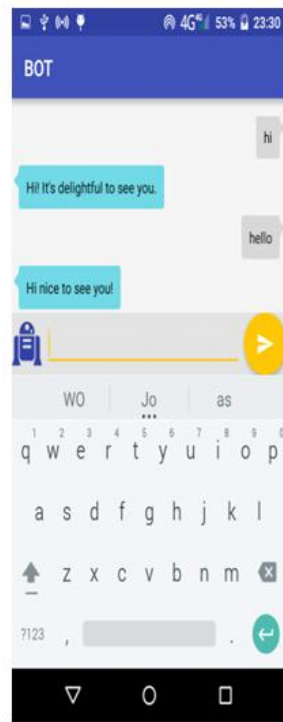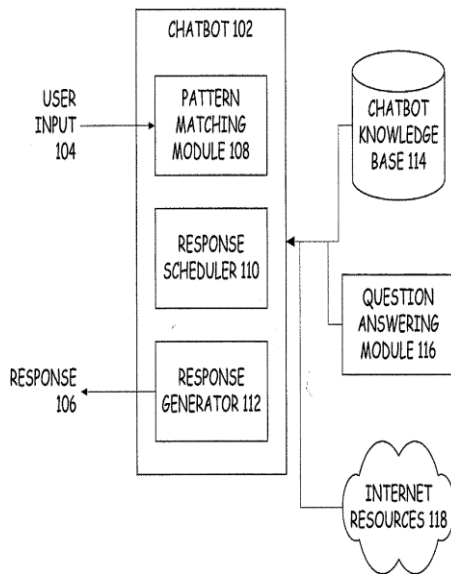
Figure 3. Data flow diagram

IV. METHODOLOGY

The incremental build model is a method of software development where the product is designed, implemented and tested incrementally (a little more is added each time) until the product is finished.

This model combines the elements of the water fall. Model with the iterative philosophy of prototyping.

Following are the algorithm to implement the proposed system as given below.

Step 1- Initialize

Step2- Input query

Step3- Pre-processing of the query. Least necessary word will be removed through preprocessing.

Step4- Fetch most valuable words from the query.

Step5-Match the fetch keywords with the knowledge base and provide apt response. The keyword will be matched with the help of keyword matching algorithm.

Step6- Output of the query.

Step7- Exit

V. CONCLUSION

The main objectives of the project were to develop an algorithm that will be used to identify answers related to user submitted questions. To develop a database were all the related data will be stored and to develop a web interface. The web interface developed had two parts, one for simple users and one for the administrator. A background research took place, which included an overview of the conversation procedure and any relevant chat bots available. A database was developed, which stores information about questions, answers, keywords, logs and feedback messages. A usable system was designed, developed and deployed to the web server on two occasions. An evaluation took place from

data collected by potential students of the University. Also after received feedback from the first deployment, extra requirements were introduced and implemented.

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A Review on Zigbee Based Parameters Monitoring and Controlling System for Induction Motor

Ankita D. Thakare[1], Punam S. Raut[1], Shital G. Lahabar[1], Prof. A. B. Nagdewate[2]

[1]UG Scholar, Electrical Engineering, DES's COET, Dhamangaon (Rly.), Maharashtra, India

[2]Assistant Professor, Electrical Engineering, DES's COET, Dhamangaon (Rly.), Maharashtra, India

ABSTRACT

Induction machines are very useful in many applications, such as suburban, commercial, engineering and utility applications due to its simple construction and low maintenance. They convert electrical energy into mechanical energy. Induction motor also used in household applications, such as pump, fan etc. It may be connected to some other form of mechanical equipment such as a winding machine, a conveyor belt or a mixer. Induction motors have existed before many years ago but were always limited in their application because it was difficult to control the speed of the motor. Monitoring of an Induction motor is a fast upcoming technology for the detection of initial faults. It avoids unexpected failure of an industrial process. Monitoring techniques are of two types as the conventional and the digital techniques. This paper proposes a wireless control and monitoring system for an induction motor based on ZigBee communication protocol. This system is safe and economic for data communication in industrial as well as in commercial fields. A module of transducers and sensors monitors the parameters of induction motor such as current, voltage, speed and temperature and transmits this data through wireless ZigBee Protocol. Microcontroller based system is used for collecting and storing the data. According to this data it will generate control signal to stop or start the induction motor through computer interface developed with Zigbee.

Keywords: Induction Motor, Monitoring System, Wireless control and ZigBee Module.

I. INTRODUCTION

In industries, Single Phase and Three Phase Induction machines are very popular because of their applications. It is necessary to protect them against faults to get uninterrupted output. Generally for various types of machines there are using various parameter controlling and monitoring systems, but in case of induction machine due to the high initial cost and physical conditions, the controlling and monitoring systems are not normally used. To overcome this, monitoring and controlling of induction motor based on Zigbee System is used which makes it more economic and simple. To start with, first we should know what is Zigbee. Zigbee is a wireless communication device as like WiFi and Bluetooth. Basic difference between Zigbee and other communication devices is that all Zigbee devices relay each other's traffic, bypassing the wired network entirely. While Bluetooth devices connect to another wireless that acts as a center and WiFi devices connect directly

to an access point, which is wired to the enterprise network using Ethernet. The Institute of Electrical and Electronics Engineers (IEEE) developed 802.15.4 standards and helped the production of Zigbee protocol and devices that support this protocol. The disadvantage of using traditional systems is that it increases the cost whereas digital systems reduce the cost of system. The basic structure of Zigbee based parameter monitoring and controlling system consists of microcontroller board and zigbee device, one set of microcontroller board and zigbee device are installed at the side of induction machine and acts as transmitter for the other microcontroller and zigbee device which is connected to the computer where the parameters are displayed on computer using software application. In addition to Zigbee Device various other sensors are used i.e. voltage sensor, current sensor, hall effect sensor and temperature sensor for measuring different parameters such as voltage, current, speed and temperature respectively. Wireless sensor network (WSN) system are pollution free, economic and reliable to operate.

II. WIRELESS ZIGBEE TECHNOLOGY

There are three network topologies of Zigbee device. They are Star Network, Cluster-Tree Network and Mesh Network. Different network topologies built up by Zigbee devices like star topology, cluster tree topology and mesh network. For all network topologies, there can be only one coordinator in each network. In star topology there is a coordinator which is responsible for all over the network. All other devices are back-end devices and directly communicate with the coordinator. This topology is suitable for networks with a centralized device and for time critical applications. Next is a cluster tree network where coordinators are still responsible for the Network initiating and

maintenance. However, routers can be used to extend the network. Routers control data flow by using hierarchical routing strategies in the network. They also may imply beacon enabled network that is defined in IEEE 802.15.4 for periodical data transmission. In mesh network coordinator is seen as responsible for the network initiating and maintenance. Routers can be used to extend the network.
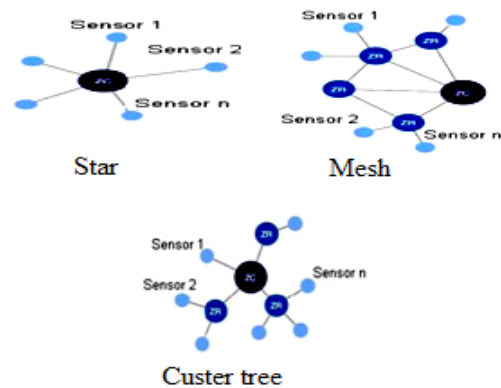
Figure 1. Structure of ZigBee

A mesh network allows full peer to peer communication. A mesh relies on this way self-healing technology so that if a node fails another route is used for the data delivery.

III. MONITORING AND CONTROLLING SCHEME

Monitoring and controlling of induction motor is an embedded system. An embedded system is a combination of software and hardware to perform a dedicated task and to make the system reliable. Fig. 3 shows the block diagram representation of the systems to be designed and implemented. The Block diagram consists of Microcontroller, LCD Display, ZigBee Module, Sensor, Power supply, Relay and Single Phase Induction Motor.

Parameters monitoring and controlling system for single phase induction motor by using ZigBee. A microcontroller is small computer on a single integrated circuit constructed of relatively simple CPU combined with support function such as crystal oscillators and timers. Microcontrollers are used automatically controlled products and devices such as automobile engine control system, office machine etc. The LCD give professional look to the embedded system. It also displays all the parameters of induction motor. The microcontroller stored the all data which collect form sensors according programming in microcontroller. Major role of this system is to collect data from sensor accordingly range of ZigBee adjusts.

Figure 2. Block Diagram of Proposed System

The microcontroller transfer all the data to the ZigBee Coordinator which act as transmitter of

wireless network. The parameters of the motor collected from the system transferred from the ZigBee End Device to the ZigBee Coordinator; and then, they have been transferred to the computer over the USB to TTL protocol. Graphical User Interface used to display received data on the screen to perform controlling commands and to storage data receive throughout the ZigBee system.

Block diagram of hardware system is shown in fig.3. The system consist of single phase induction motor, voltage sensor, current sensor, digital signal controller, a temperature sensor, a desktop computer. To design the interface program java programming used and finally ZigBee module for wireless communication.

The system consist of following component:

a) MICROCONTROLLER

Microcontroller can be termed as a single on chip computer which includes number of peripherals like RAM, EEPROM, Timers etc., required to perform some predefined task. There are number of popular families of microcontrollers which are used in different applications as per their capability and feasibility to perform the desired task, most common of these are 8051, AVR and PIC microcontrollers.

b) VOLTAGE SENSOR

The voltage sensor measures the instantaneous values. It allows for the measurement of direct or alternating voltages with electrical insulation between the primary and secondary circuits. This voltage is passed through an insulating amplifier and is then converted to a secondary output current. This secondary current is electrically insulated from the primary voltage to which it is exactly proportional.

c) CURRENT SENSORS

In proposed system, we used current sensors based on hall effect having Maximum Primary Current 25A, Secondary Voltage (Vo): 2.5 ± 0.625, frequency: DC- 25kHz, accuracy: 0.1%. The Hall Effect is the production of a voltage difference (the Hall voltage) across an electrical conductor, transverse to an electric current in the conductor and to an applied magnetic field perpendicular to the current

d) Hall Effect Sensor

A Hall Effect sensor is a transducer that varies its output voltage in response to a magnetic field. Hall Effect sensors are used for proximity switching, positioning, speed detection, and current sensing applications.

e) TEMPERATURE SENSOR LM35

Temperature sensor used in this work is the LM35 semiconductor sensor manufactured by National Semiconductor. The LM35 series are precision integrated circuit temperature sensors, whose output voltage is linearly proportional to the Celsius (Centigrade) temperature.

f) RELAYS

A relay switch is used for the controlling of induction motor. It performs the on and off operation of induction motor. It can be simply divided into two parts i.e. input part and output part. The input section has a coil which generates magnetic field when a small voltage from an electronic circuit is applied to it. This voltage is called the operating voltage. Commonly used relays are available in different configuration of operating voltages like 6V, 9V, 12V, 24V etc. The output section of relay switch consists of contactors which mechanically connect or disconnect. The contactors in a basic relay are of three types: normally open

(NO), normally closed (NC) and common (COM). The COM is connected to NC, at no input state. The relay coil gets energized, when the operating voltage is applied to the relay and the COM changes contact to NO. There are Different relay configurations are available like SPST, SPDT, and DPDT etc, which have different number of changeover contacts. We can be switched on and off electrical circuit, by using proper combination of contactors.

g) LCD (LIQUID CRYSTAL DISPLAY)

LCD have a standard ASCII set of characters and mathematical symbols. For an 8-bit data bus, the display requires a +5V supply plus 11 I/O lines. For a 4-bit data bus it only requires the supply lines plus seven extra lines. When the LCD display is not enabled, data lines are tri-state and they do not interfere with the operation of the microcontroller. Data can be placed at any location on the LCD.

h) SOFTWARE DETAILS

The system software is used to build the Java Programming that works under the Windows Operating System. It has highly flexible programming structure. Motor parameters collected from the system transmitted through the ZigBee module to the computer over the RS232 protocol.

In the proposed system for monitoring & controlling of parameters of induction motor Flash Magic software is used. Flash Magic is a PC tool for programming flash based microcontrollers from **NXP** using a serial or Ethernet protocol while in the target hardware. Flash Magic works on Windows XP, Vista, 7, 8 and about 10. 10 Mb of disk space is required.

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"Design and Fabrication of Pedal Operated Lawn Mower"

Sourabh Gandhi[1], Devendra Dhakate[1], Ajay Durge[1], Sheikh Faisal Raza[1], Shubham Tiwari[1], Vivek Shahi[1], Arsalaan Sheikh[1], M. Sohail Pervez[2]
[1]Mechanical Engineering, ACET, Nagpur, Maharashtra, India
[2]Asst. Professor, ACET, Nagpur, Maharashtra, India

ABSTRACT

The lawn mower is a device which is used to cut the grass in a lawn to even height. It is required to maintain the uniform level of grass as in the case of golf courses, party lawns, etc. At present grass cutters are operated by fuel and electrical energy, thereby exhausting the resources. The present project is to design & fabricate a grass cutter with reciprocating action of its cutting blade. In our project we fabricate the grass cutting machine for the use of Lawn and Golf Courses to cut the grass in the field. It can be operated manually through pedaling. It is simple in construction and its working is easy. The design objective is to come up with a mower that is portable, durable, easy to operate and maintain. It consists of a simple mechanism and the components such as chain and sprocket, sickle bar, single slider mechanism, wheel.

Keywords: Lawn mower, Tadpole, Manually Operated, Chain Sprocket mechanism

I. INTRODUCTION

A lawn mower (mower) is a machine utilizing one or more revolving blades to cut a grass surface to an even height. The height of the cut grass may be fixed by the design of the mower, but generally is adjustable by the operator, typically by a single master lever, or by a lever or nut and bolt on each of the machine's wheels. The blades may be powered by muscle, with wheels mechanically connected to the cutting blades so that when the mower is pushed forward, the blades spin, or the machine may have a battery-powered or plug-in electric motor. The most common power source for lawn mowers is a small (typically one cylinder) internal combustion engine. Smaller mowers often lack any form of propulsion, requiring human power to move over a surface;

"walk-behind" mowers are self-propelled, requiring a human only to walk behind and guide them.

Larger lawn mowers are usually either self-propelled "walk-behind" types, or more often, are "ride-on" mowers, equipped so the operator can ride on the mower and control it. A robotic lawn mower ("lawn-mowing bot", "mowbot", etc.) is designed to operate either entirely on its own, or less commonly by an operator by remote control.

There are several types of mowers, each suited to a particular scale and purpose. The smallest types, unpowered push mowers, are suitable for small residential lawns and gardens. Electrical or piston engine-powered push-mowers are used for larger residential lawns (although there is some overlap).

II. PROJECT DESCRIPTION

In our project we are using Tadpole type of frame which will be operated by a single person. Tadpole type structure has two front wheels & one rear wheel which is driven by the pedal. This frame is stable & comfortable at slow speed, also tadpole type of structure prevents over steering. In our project we are using the grass cutter for cutting the grass in the field. It consists of simple manner and the using components are chain and sprocket, sickle bar, single slider mechanism, wheel, cutter. Arrangement witches this project using two cutter one movable cutter another one fixed cutter the movable cutter is connecting to the single slider mechanism through links and slider is rotating help of pedal. Here the pedal is working using with the help of human power supply; When the pedal to start running the shaft is rotate and it's rotating the single slider mechanism is rotating with attach of cutting blade and the cutting process is carrying out by this machine. The grass cutter vehicle is moving help of human power .The pedal is connecting with the chain and sprocket arrangement with wheel shaft.

Tadpole- The first tadpole trikes were introduced in the year 1970. Even though it originated in Japan it was the United States where they were most prevalent. The original trikes work quit long compared to tadpole type of today. With its extremely low Centre of Gravity aerodynamic layout & light weight they are considered as highest performance frame. A configuration of two wheels in the front and one wheel at the back presents to advantages: it has improved aerodynamics, and that it readily enables small lightweight motorcycle power plant and rear wheel to be used. With a single driven rear wheel, all power is directed through a single wheel. The wheel must support

acceleration loads, as well as lateral forces when in a turn, and loss of traction can be a challenge in some model type .With two wheels in the front (the "tadpole" form or "reverse trike") the vehicle is far more stable in braking turns, but remains more prone to overturning in normal turns compared to an equivalent four-wheeled vehicle, unless the centre of mass is lower and/or further forward.
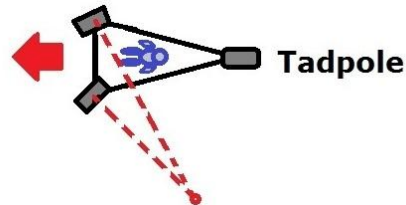
PROPOSED DESIGN
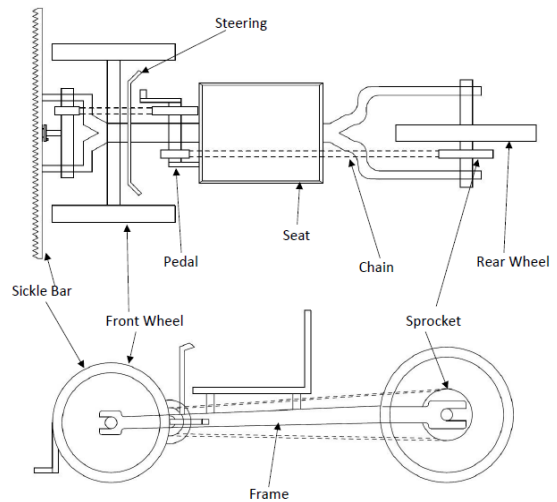
DESIGN CALCULATION

Considering SAE 1040 as the material of frame

Assuming maximum load 130 kg
$=130 \times 9.18 = 1275.8N$

Assuming total length of frame $=50"=1270mm$

$1"=25.4mm$

Factor of safety $=1.5$
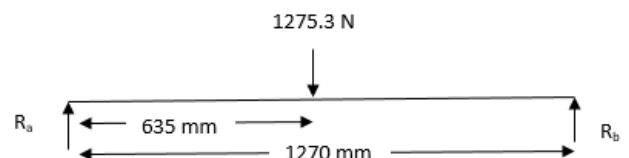
Considering frame as simply supported beam

Considering forces system in Equilibrium

$R_a + R_b = 1275.8N$

Taking moment at point A

$Ma=0$

$1275.8 \times 635 - Rb \times 1270 = 0$

$R_b = 637.65N$

$Ra = 637.65N$

Taking Bending moment

$BM = 410 \times 10^3$ N-mm
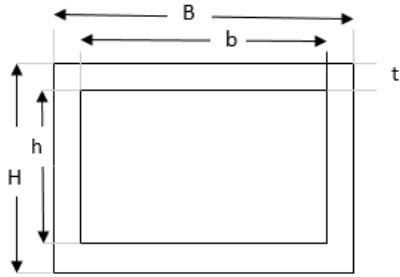
Considering Rectangular cross section of material

Bending stress $=M/Z$

$$Z = BH^2/6 - bh^3/6H$$

$$B = 1.5" = 38.1mm$$

$$H = 1" = 25.4mm$$

Thickness (t) $=2mm$

$b = 34.1mm$

$h = 21.4mm$

$Z = 38.1 \times 2 \times 5.4^2/6 - 34.1 \times 2 \times 1.4^3/6 \times 25.4$

  $= 2 \times 10^3$ mm³

Bending stress Induce $= 410 \times 10^3/2 \times 10^3$

$\qquad = 205Mpa$

For SAE1040

$S_{yt} = 350Mpa$

Bending stress Allowable $= S_{yt}/FOS$

$\qquad = 350/1.5$

$\qquad = 233.33$ Mpa

Induce Bending stress is less than Allowable Bending stress

Torque Calculation

Human Input Power

Assuming Weight of one healthy person is 50kg.

$W=50kg$ (Weight is converted in to force)

$F=50*9.81$

$F=490.5N$

Length of Crank=17cm =170mm

Torque:

$T=F*L$

$T= 490.5*170$

$T=83385N$-mm

$T=83.385N$-m

Torque require to overcome the friction:-

Assuming Whole weight of measure of mower with a human is= 130kg

Let, Assume that weight is equally distributed among three tyres.

$=130/3$

$=43.33$ kg

Co-efficient of friction for Lawn=0.6

Traction Force:

$Fr=uR$

$=0.6*(43.33*9.81)$

$Fr=235.45N$

Maximum traction force is also equal to the

$Fr=255.04N$

Because Power is only supplied to rear single wheel.

Torque Required:

$T=Fr*R$

$\qquad$ …Where, R-Radius of Wheel =30cm

$=255.04*0.3$

$T=76.51$ N-m

$T_{shaft} > T_{Fr}$

$83.385N$-m $>76.51N$-m

Steering Calculation

Ackermann geometry is to avoid the need for tyre to slip sideways when following the path around a curve. While going around a corner all the tires turn along the circle with a common center point. In this outer wheel has less angle than Inner wheel.
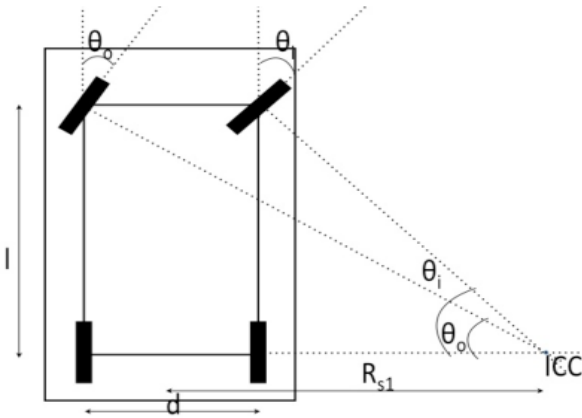
In fig. θo= Angle of outside Lock

θi= Angle of Inside Lock

d= Wheel Track

l= Wheel Base

Total length (L) = 120mm

Width (D) = 66mm

Assuming $\theta i = 40°$

Formula:-

$$\cot(\theta o) - \cot(\theta i) = D/L$$
$$\cot(\theta o) - \cot(40) = 66/12$$
$$\theta o = 30°$$

III. CONCLUSION

Thus we can conclude that tadpole type of manually operated lawn mower has been found suitable & requires less effort for very large lawns. A single person can operate the present setup & can cut the grass evenly in less time by harnessing human power only.

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"Real Time Taxi Ridesharing"

Nandini Shende, Kunal Mohod, Prof. M.S. Khatib, Prof. Farheena Shaikh

Department of CSE, Anjuman College of Engineering and Technology, Sadar, Nagpur, Maharashtra, India

ABSTRACT

The Projectis designed to create a Real-time taxi ride Sharing Application. It works by accepting a real-time ride requests from the passengers sent through smartphones and schedules proper taxis to pick them up via ridesharing. The monetary constraints of the application are to provide benefits for both passengers and taxi drivers, passengers pay less amount compared with no ridesharing and get compensated if their travel time is lengthened due to ridesharing, taxi drivers will make money for all the detour distance due to ridesharing. The application is also significant to social and environment benefit, e.g., saving energy consumption and satisfying people's commute, plays important role in reducing traffic ratio. Fare isn't that costly.

Keywords: Taxi-sharing, real-time taxi-sharing, ride sharing.

I. INTRODUCTION

Taxi play a very significant role in daily basis. Taxi plays important role in transportation between public and private sectors, delivering thousands and millions of people to different locations in urban areas. However, many people spend a long time on roadsides due to much higher demands of taxi than the number of taxis in peak hours of major cities.

Increase in the amount of taxis for the people appears to be a clear solution. But it carries some non-good effects, e.g., bringing more traffic on the surface of the road thus, resulting more energy consumption, and it also cause reduce in taxi driver's income (considering the fact that demands of taxis would be lesser than number of taxis during off–peak hours).To deal with this issue, we propose a real time taxi-sharing application that receive taxi passengers' real-time ride requests sent from smartphones and schedules proper taxis to pick up them via taxi-sharing with time, capacity, and monetary constraints (the monetary constraints guarantee that passengers pay less and drivers earn more compared with no taxi-sharing is used).

In this application, taxi drivers autonomously determine when to join and leave the service using an App installed on their smartphones. Using the same App, passengers submit their real-time ride requests. Each ride request consists of the origin and destination of the trip and based on the distance travelled by them the cost is computed. If the taxi is ridesharing then, the amount is distributed amongst the passengers.

II. OBJECTIVE AND SCOPE

- ✓ It provides real time taxi ride sharing at low cost or reasonable cost.
- ✓ Reducing the traffic ratio i.e. minimum
- ✓ Traffic on the road.
- ✓ Transportation facility will be available everywhere.
- ✓ Safety of Rider /person.

III. PROBLEM DEFINATION

Taxi is an important transportation mode between commercial and private transportation, delivering thousands of millions of passengers to different locations. However, the number of taxi is much less than its demand in peak hours of major cities, due to this many people stand at roadside waiting for the taxis. Multiple taxi statues can satisfy a ride request, but the goal is usually to find the optimal taxi.

A variety of functions have been used in the existing literature, where a cost function has been combined with multiple factors such as travel distance increment, travel time increment and passenger waiting time, is the most common.

IV. DYNAMIC TAXI RIDE SHARING

The problem with the earlier taxi ridesharing system was that people spend more time on road for taxi and their might be some chances of not getting a taxi for travelling. Increasing the taxi ratio seems an obvious solution but, it advances the road traffic, increase the energy consumption and create a non-good environment. Arrival of the taxi at peak time is also a taxi sharing system problem, to address these issues we have created a real-time taxi ride sharing application that accepts passengers real-

time ride requests sent from smartphones and schedules proper taxis to pick up them via taxi sharing with time, capacity, and monetary constraints. Though real-time taxi-sharing has been studied in several previous works, our work demonstrates three major advantages. First, our problem definition is more realistic by

considering three different types of constraints. Some existing works did not consider time window constraints and none of these previous works explicitly monetary constraints. Second, we analysed the computational cost of each component of the system, proposing a spatio-temporal index and a taxi searching algorithm, which significantly improve the system efficiency. Third, simulation results presented here is more convincing as we evaluated our system based on the real data and at a much larger scale than most previous works did.

V. SYSTEM ARCHITECTURE

The System consists of two participants - Driver and Rider. Both of them can access the ride sharing system through the ride sharing application installed in their mobile device. To participate in the ride sharing, both of them have to register for the first time using their mobile application. This registration and login process is affected by the registration service and the user account data is stored in the Accounts profile database. Apart from the login data, the accounts profile database also comprises of other details such as the user address, Phone no, number of seats and the car type in case of a driver.

The process begins with the rider registering his ride through the mobile application. The ride registration data comprising of source, destination address and start time of the ride. The rider after

login searches for the ride through his mobile application. The ride request is processed by the ride sharing service. The filtered search result is presented to the rider along with the driver details and cost. After the rider selects a driver, rider request is passed on to the driver's mobile application by the ride sharing service. After the driver's approval, driver send confirmation message on rider's mobile phone and rider are enabled to communicate through the ride sharing application. Once the ride starts, ride tracking service starts tracking the ride using the GPS data from the user's mobile device. This data is temporarily stored in the accounts profile database to provide assistance in case of an emergency.

After the completion of the travel, rider provides the rating and comment for the driver which is processed by the riding service and stored along with driver's profile data in the accounts profile database. The cost of the of rider is calculated based on the distance and cost propose by driver.

Figure 1 shows the flow graph of real-time taxi ride sharing at the rider's end. The rider or the passenger first has to registered to an application by using their smartphone only after that they are able to get the service of taxi sharing system. The rider should enable the GPS at the background for the reliable service. After enabling the GPS, the rider will choose the destination and scan taxi using smartphone.

The rider selects a taxi and the request is passed on to the driver's mobile application. After the driver's approval, driver send confirmation message on rider's mobile phone and rider are enabled to communicate through the ride sharing application. After the completion of the travel, the cost of the of rider is calculated based on the distance travel and cost propose by driver.

VI. DATA FLOW GRAPH

Figure 1. At rider's end
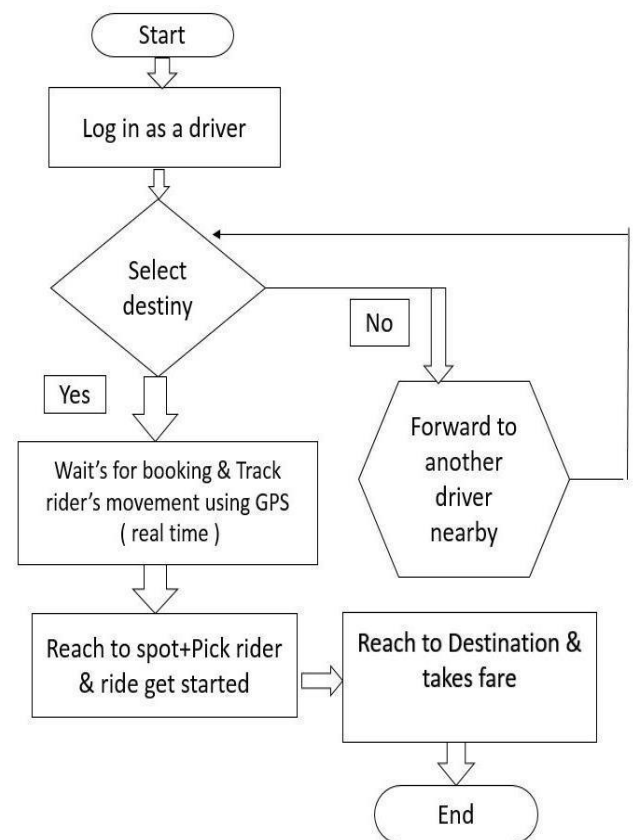
Figure 2. At Taxi driver's end

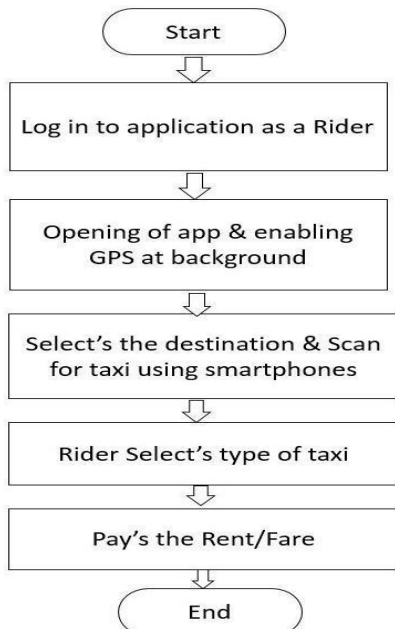Figure 2 shows the flow graph at taxi drivers end. The taxi driver also has to register to an application by using smartphone installed in their mobile device. Once the rider has login and searches for the ride through his mobile application, the ride request is processed by the ride sharing service. If the taxi is available near-by to the rider, then the driver will accept the ride request. Otherwise the driver will forward the request to another taxi drivers. Cost is calculated based on the distance travelled by the rider.

VII. CONCLUSION

Real time taxi-ride sharing application is very effective way to minimize pollution and the congestion of vehicles in cities. Travelling can be done in eco-friendly way. It provides an opportunity to meet new people on daily basis. System saves the total travel distance of taxis when delivering passengers. Our system can enhance the capability of delivering passengers and can satisfy their needs. The system can also save the taxi fare for each individual rider while the profit of taxi drivers does not decrease compared with the case where no taxi sharing is conducted.

VIII. FUTURE WORK

In this system, the basic concept of taxi ride sharing through real-time request generation and its acceptance in future work involves refining the ridesharing model by introducing social constraints, such as gender preference, habits preference (e.g. some people may prefer co-passengers who do not smoke) and may also use social networking sites for real time request.

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Survey on Performance Analysis, Document Depositories and Exam Interfaces

Ramanand Samdekar¹, Prajakta Parate², Pooja Yerpude², Himani Chelani², Pallavi Kamble²

¹Assistant Professor , Department of Computer Science and Engineering S.B. Jain Institute of Technology, Management and Research, Nagpur, Maharashtra, India

²Student Department of Computer Science and Engineering S.B. Jain Institute of Technology, Management and Research, Nagpur, Maharashtra, India

ABSTRACT

The survey is based on various web applications which provide profile and performance tracking of a person. While it also provide additional feature of 'Document depository'. This site is useful for performance tracking of a person. We can connect to professional social sites through this application. It act as an interface between user and actual examination site.

Keywords: Web Application, Performance analysis system, Tracking, document depository, social media , personal details.

I. INTRODUCTION

To provide a single tracking platform to track performance and academic history of all the skill workforce. The initiation can be done at the Engineering and Management Students as it covers the majority stakeholders. The program can be extended to other skilled workforce such as blue collar employees. The services are academic verifications, prior address verification, academic , resume vetting, all streamlined in a convenient plan that can take a load off an employer's mind. Academic to post-employment verifications catering to the fast growing IT, AUTOMOBILE and other industries in India. We have included one of the best of these for people looking for this sort of service. The site uses a leverages technology to help reduce risk when hiring.

Accrediate Screenings offers multiple solutions for enterprise clients with varying business needs. So whether your organization uses Skills Tracking System to recruit new talent or is looking for stand-alone screening we have options that can fit your organizations needs and scale. Businesses can streamline background screening processes with a proper evaluating integration or customized solution. We can provide you with information and tools based on our industry knowledge.

A. Goals and Objectives:

- ✓ To provide centralized verified document depository of all your records. With sharing option with the prospective employer or education institute.
- ✓ To provide experts who analyze your academic as well as professional experience

and provide you the basic analysis. One to one guidance along with advance analysis is also provided.

✓ To provide common exam interface and apply for various competitive exams. Rejection due to small mistakes are reduced.

✓ To provide depository for all the records throughout user's careers.

II. LITERATURE SURVEY

This paper describes that with the traditional framework design methods to design web, resulting in large limitations, time-consuming and other issues, for such problems, this paper presents the design and implementation method of a web based on Laravel framework, Laravel make the development process is standardized, processing some non-business logic relationship automatically [1].

In this era of Internet everyone is free to access the data. Security is the main issue when we are developing any web application. Now a day's PHP is very well known name for web application development. There are so many open source PHP frameworks available for web application development. In this paper we are talking about security features available in Laravel framework for web application development using PHP language [2].

The objective of my study is to evaluate the performance of procedural PHP with codeigniter and laravel framework. The decision of making this study is based on the fact that there is a lack of comparison tests between the popular PHP frameworks like laravel, codeigniter with plain php[3].

The decision of making this study is based on the fact that there is a lack of comparison tests between the popular PHPframeworks like laravel, codeigniter with plain php. The result outcome of this experiment have been analyzed and interpreted in order to expose the performance of the targeted frameworks [4].

Currently, Massive Open Online Courses (MOOC) is having significant impact on E-learning by providing free campus curriculum for millions of viewers over the world. Most of MOOC mainly include literal tutorial, video course and easy quiz, but lack of an identical and easily operational experiment environment with durable data. It is crucial for participants to learn complicated courses involved practical programming and multi-host network interaction. In this paper, we focus on the construction of an E-learning platform based on Laravel framework implementing the customized virtual experimental environment, which in accordance with teachers' requirements, by using Proxmox virtualization technology and VNC client noVNC based on HTML5. In this way, every experiment

can be configured with multiple virtual internet hosts wherein user operation and data is saved durably so as to conduct more complicated experimental operation next time[5].

The present paper focuses on means of creating a framework for e-learning services by integrating learning and dedicated information systems facilities within a web portal. The information system facilities are provided into the web portal by retrieving the dedicated software services from the specific systems and synchronizing databases based on various technologies (php / postgresql, asp / MS sql). The

portal uses MS technology and provides, as learning services, management content and e- learning facilities for various user categories, together with the dedicated information system facilities[6].

III. PROPOSED WORK

In this website all records of students throughout their career are stored. Some of the records are also validated and verified by competitive agencies. This website will work with registered students through entire academic and professional journey. All their credentials are validated by us. This helps them to raise their trustworthiness.

A. Flow of the system

There is a portal through which user can login. They can read newspapers or blogs which are updated by admin.

After successful login user is able to view dashboard that shows summary of user performance in the form of graphs and charts. User have to fill the details like personal, health, Academic, professional details.

User can also connect to social media like linkedin, facebook, twitter and skype.

User will get recommendation for the future studies and even user can apply for different exams.
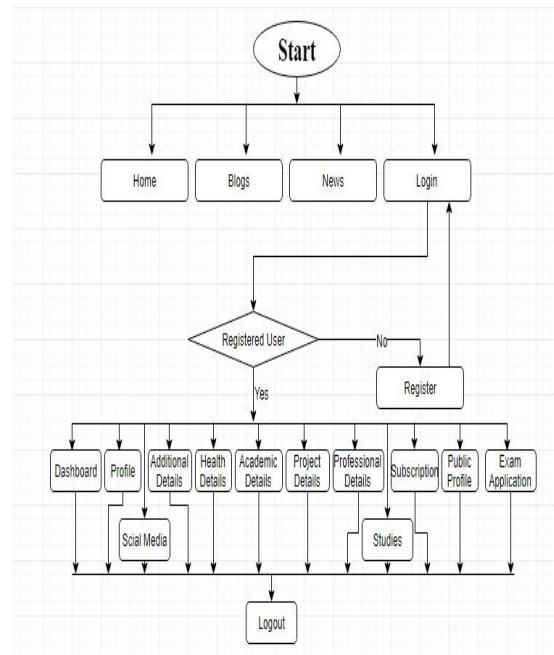
Figure 1. Flowchart of Accrediate

B. Functional Module

The whole system is divided into 2 modules. They are Admin Module and User Module.

Module 1: Admin

The Admin can track all the activities of the user. Admin can add and delete user. Admin is provided with functionality of updating news and writing blogs. Admin can verify the documents uploaded by the user. It has responsibility of approving boards, institute, university and college. Admin can forward the documents provided by the user to the organization.

Module 2: User

User are the registered persons how are using this application on daily basis. User can fill all the important fields require by the application. User need to fill the additional details like health, project and family details. User can store the documents in the document repository so that

when it is needed it can access that. User can get the appropriate subscription based on redeem.

IV. CONCLUSION

This survey helps in building a system for tracking and storing documents of a user. It focuses on performance of a person and job profile of a person. With this study we have built the generalized and efficient accrediate which is beneficial for both organization, institute, students and job seekers as well.

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A Review on GPS Attendance System Using RFID in IOT

Akbar Nagani[1],Payal Gour[2],Aqeeba Sheikh[3],Rakhi Kanoje[4],Ruby Afshan[5]

Assistant Professor, Electronics and Telecommunication Engineering,Anjuman College Of Engineering And
Techonology, Nagpur, Maharashtra, India

ABSTRACT

Radio Frequency Identification (RFID) systems and have been successfully functional to different areas as diverse as transportation, health-care, agriculture, and hospitality industry to name a few. IOT technology facilitates automatic wireless identification using electronic passive and active tags with suitable readers.GPS is a device that is capable of receiving information from GPS Satellites and then to calculate device geographical position. In this paper, an effort is made to solve regular lecture attendance monitoring problem. In this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture face-to-face classroom data for allocation of proper attendance.

Keywords: RFID,GPS,IOT,Attendance.

I. INTRODUCTION

IOT is a dynamic global network organization with self configuring capabilities based on standard and interoperable communication protocols In the IOT, physical and virtual ─things ‖ have identities, physical attributes, and virtual personalities and use intelligent interfaces The physical and virtual ─things ‖ are seamlessly integrated into the information network RFID is shaping up to be an important building block for the Internet of Things (IOT). Wearable RFID Tags are given to all of your personnel. RFID Readers are installed at strategic points in your college environment such as entrances, exits, and area-wide zones so that they can "read" the signals being broadcasted by the RFID Tags worn by your student. Each RFID Tag assigned to your student transmits data. This information is then imported into the student Locating Software. Through an intuitive interface,

you can track and locate student from a PC, remotely on your web browser, or even on a mobile device. RFID (Radio Frequency Identification) devices are wireless microchips used for tagging objects for automated identification RFID systems consist of a reading device called a reader, and one or many tags the reader is a powerful device with ample memory and computational resources RFID can identify objects wirelessly without line-of-sight. Attendance system will produces an automatic system which give better routine and efficiency than the traditional method of observing student.

Furthermore, RFID technology can help to identify and to monitor items (products, people, student etc) wirelessly within a specified distance (a few centimeters to hundreds of meters). In this paper, we describe the proposed RFID system for recognizing and monitoring attendance. In this

system, the RFID tags enable the school/college management people to supervise the student movement in and out of the campus. When RFID tags pass through the RFID reader in read range zone, then system will record the data from the RFID tags to the database systems. Have caused students to be less motivated to come to the lecture rooms than ever before. Laziness on the part of students, nonchalance to school work, extra social activities that have no importance in aiding the objectives of the institution and a lot more, may prevent students from attending lectures. Sequel to these, lecturers and administrators in most developing countries have had to come up with ways to ensure a healthy participation from students, and make sure that the student-lecturer interactive relationship is kept intact. This in some cases have come in simple forms like roll calls, while in more interesting cases, can be formats like surprise quizzes, extra credit in class, etc. These strategies are however time consuming, stressful and laborious because the valuable lecture time that could otherwise been used for lectures is dedicated to student attendance taking [8] and sometimes not accurate. Before the RFID IOT system smart-card and barcode are more popular for all purpose like supervision, attendance or for monitoring student, employees etc. In this we are going to implement the RFID system in our project for improvement of old attendance system and checking system for better result and security of the student. An RFID tag is an object that can be applied to or inserted into a product, person, or animal for the purpose of identification and tracking using radio waves. Some identifiers can be read from several centimeters or meters away and beyond the line of sight of the reader. A number of related works exist in works, application of RFID Technology to different areas and specifically to the area of academic attendance monitoring problem.

II. METHODS AND MATERIAL

For operating this project first user has to insert the card numbers into the microcontroller memory. It can be done by company authority person or college administration person while issuing the card. Whenever a new student joins o is admitted in a college at that time, card will be issued. And same entry will be made in the microcontroller program memory. In the current project, these numbers are stored in the microcontroller's program memory. Which means while burning the program into memory, we need to add these card numbers into the program. Then this card will be issued to the respective person .Once the project is switched on, it will display time clock on LCD. We have provided —4 by 1‖ keypad for setting the time. User can press the setting key and use the increment / decrement and enter button to set the current time. Once the time is set then he/she can exit from the time setting mode / time set routine. Then the LCD will display current time set by user. Then this project operates in normal mode. Whenever user comes near RFID reader module and shows RFID tag then microcontroller will store 2 information or 2 types of data will in the microcontroller memory. First is the card number and second is the time at which user has shown the card. Same situation happens for logout. For logging out also student will show the card. In this project single RFID card reader module will be used for in and out operation. While in actual implementation in industries or colleges, user can install 2 RFID reader modules. One will be placed at the outer side and second at the inner side of the door. When a student has lost his/her card. Then in such situation he/she has to report this incident to the administration person. Then admin person can remove the card number from microcontroller memory. Also when any student leave the college

and they forget to return the card then at time also authority person will remove the card information from microcontroller memory. So in case of lost card or person left the college without returning the card and if these cards are shown to RFID reader then buzzer will be turned on. Lets take an example that any outside/unauthorized person get a RFID card. And these cards does not have entry in our system. Or if existing student manages to get a RFID card, and if he/she shows card, then microcontroller will check and find that this card is not stored in the memory. It means card number is not found in microcontroller memory then buzzer is turned on.

III. BLOCK DIAGRAM
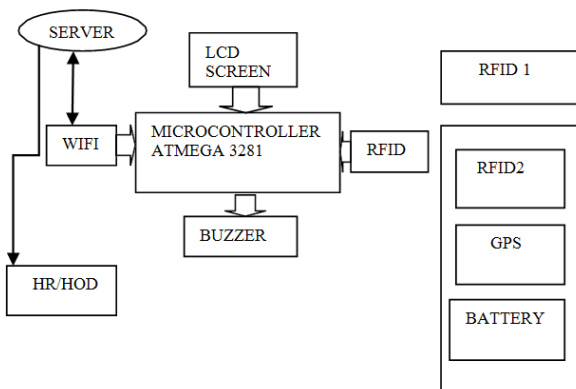
1) RFID Reader:
Full form of RFID is ―Radio Frequency Identification. Wireless communication is used between RFID tags and RFID Reader. Reader does not require line of sight communication with tags. It means that Reader detects the RFID tag even if there is some object between Card and Reader. Thus it is a non-contact type of reader. The Radio frequency used in our reader is 125 kHz which is a Low Frequency (LF). RFID reader interfacing with Microcontroller is done using serial port. RFID reader will communicate with Microcontroller using serial communication. When RFID tag comes in the range of Reader module, then RFID reader detects RFID card. And at that time RFID reader sends out a series of alphanumeric unique codes on the serial port. So while adding the employees/student card number in the program memory. First we need to store this series of alphanumeric code into program memory and later on this unique series of codes will be compared with the incoming card number. RFID card reader module requires 9 volt power supply and output is given on DB9 connector port.

2) RFID cards:
There are two main types of RFID cards, Passive and Active. In this project we have used Passive RFID tags. As given in introduction, we can use normal RFID cards which are of the size of credit card. These are rectangular in shape and white in color and can be attached with the ID-card. Or even we can use RFID tags which can be attached with keychain.

3) Microcontroller:
It is the main component of the project. It is the heart of the system. Microcontroller communicates with all input and output devices. Various functions of Microcontroller are as follows:

1. Displaying clock on LCD.
2. Reading input from RFID reader.
3. Comparing it with the data / RFID card number stored in Microcontroller memory.
4. Turning on buzzer if the cards does not match.
5. Logging/Storing time into memory if cards match.
6. Reading input from keypad and adjusting time according to the keypad entry given by user.
7. Sending data to computer.

4) Keypad:
We have used 4by 1 keypad. It is a simple type of keypad. It gives low output to Microcontroller when key is pressed. It has 4 keys.

Functions of these keys are Increment, Decrement, Enter and Escape. These are used in Time setting mode.

5) Buzzer: We have used 12 volt buzzer for demonstration purpose. Buzzer will be turned on for invalid card access.

6) Liquid Crystal Display: It is used to show current time and various messages. These messages are Invalid card, Valid card, attendance of student. We have used 16 by 2 alphanumeric display.

Advantages:

1) This system is fully automated and it does not require any human interaction except setting the initial time setting.
2) LCD and PC interface both are provided with RFID based attendance system. This gives benefit of viewing attendance on the spot on LCD or remotely from computer.
3) This system is accurate and can avoid proxy or false attendance.

Future Development:

1) We can voice announcement system to this project. so whenever user logs in, we can announce message like, -Your attendance has been logged in or -Your card is invalid.
2) We can send this data through internet to the user. So that user can access it remotely via internet.
3) We can implement GSM technology.

IV. CONCLUSION

In this System, Smart Attendance System using RFID and GPS can replace the manual system that transformation of information can be delivered without a hitch. This system will ease is

school/college to monitor the student. The system can reduces manpower. Although there are different methods of tracking student but our system is very easy to handle and very convenient for college/university level. This system gives time saving, easy control and reliability.

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Overview of Fingerprint Identification

Dr. LeenaGahane¹ , Rashida Ali², Aparna Sharma²

¹Professor Department OF Physics ,Anjuman College Of Engineering and Technology , Sadar , Nagpur, Maharashtra, India

²BE.II Sem ,Anjuman College Of Engineering and Technology , Sadar , Nagpur, Maharashtra, India

ABSTRACT

This article is an overview of a current research Based on fingerprint recognition system. Here, we have highlighted on the previous studies of fingerprint recognition system and its review in the conceptual &Structur of fingerprint recognition .The basic fingerprint Recognition system consist of four stages: firstly ,the sensor Which is used for enrolment &recognition to capture the biometric data .Secondly ,the pre-processing stage which is used to remove unwanted data and increase the clarity of ridge structure by using enhancement technique. Thirdly, feature extraction stages which take the input from output of the pre-processing stage to extract the fingerprint feature. Fourthly,the matching stage is to compare the acquired feature with the template in the database.

Finally the data base which stores the feature for the matching stages .The current trend of fingerprint sensing and identification algorithms are presented in detail in order to show how fingerprint based system works .These include actual example of fingerprint based personal identification system ,large scale fingerprint identification system (AFIS) International activities on standardization and performance evaluation and a "Fingerprint User Interface(FPUI),which is a new type of application of this technology used to enhance human -machine interaction . Also we put in to few suggestions for the errors which occurs in some of the cases due to defects in finger ridges. Also suggesting a multi sensor device.

Keywords: Biometric, Fingerprint, Security, Identification.

I. INTRODUCTION

Along of various biometrics techniques, In the past few decades, human-beings have been addicted to various technologies such as captured photos, scanned signatures, bar code systems, verification Id & so on. Also, Biometrics is oneof the applications in Image processing which refers to technologies that used physiological or behavioural characteristics of human body for the user authentication. The biometric authentication system based on two modes:

II. ENROLMENT AND RECOGNITION

In the enrolment mode, the biometric data is acquired from the sensor and stored in a database along with the person's identity for the recognition. In the recognition mode, the biometric data is re-

acquired from the sensor and compared to the stored data to determine the user identity.

Biometric recognition based on uniqueness and permanence. The uniqueness means that there is no similarity of feature between two different biometrics data. For example, there are no two humans having the same fingerprint feature even if they are twins. And when the features of biometrics do not change over the lifetime or aging, it is called permanence. Biometrics can have physiological or behavioural characteristics. The physiological characteristics are included in the physical part of body such as (fingerprint, palm print, iris, face, DNA, hand geometry, retina... etc). The behavioural characteristics are based on transaction taken by a person such as (Voice recognition, keystroke-scan, and signature-scan). Any biometrics system including two phases first phase is enrolment phase and second is recognition phase. The recognition phase divided to two things which is verification and identification. During the enrolment phase the biometrics data are captured and generate digital image then Pre-processing apply to digital image for removing unwanted data and apply the post-processing than store this data in database. In the case of identification process the fingerprint acquired from one person is compared with all the fingerprints which store in database. Also it is known as (1:N) matching. it is used in the process of seeking the criminals. In the verification process the person's fingerprint is verified from the database by using matching algorithms. Also it is known as (1:1) Matching. It is the comparison of a claimant fingerprint against enroll fingerprint, initially the person enrolls his/her fingerprint into verification system, and the result show whether the fingerprint which take from the user is matching with the fingerprint store as a template in database or not match.

III. FINGERPRINT

A friction ridge is a raised portion of the epidermis on the palmar (palm and fingers) or plantar (sole and toes) skin, consisting of one or more connected ridge units of friction ridge skin.These ridges are sometimes known as "dermal ridges" or "dermal papillae".Fingerprint identification (sometimes referred to as (dactyloscopy) is the process of comparing questioned and known friction skin ridge impressions (see Minutiae) from fingers, palms,and toes to determine if the impressions are from the same finger (or palm, toe, etc.).The flexibility of friction ridge skin means that no two finger or palm prints are ever exactly alike (never identical in every detail), even two impressions recorded immediately after each other.

Fingerprint identification (also referred to as individualization) occurs when an expert (or an expert computer system operating under threshold scoring rules) determines that two friction ridge impressions originated from the same finger or palm (or toe, sole) to the exclusion of all others.

IV. FUNDAMENTAL STEPS OF FINGERPRINT
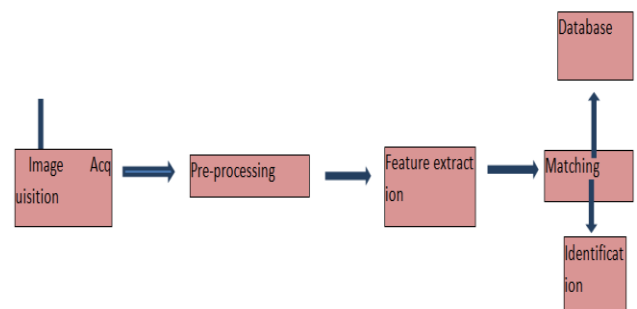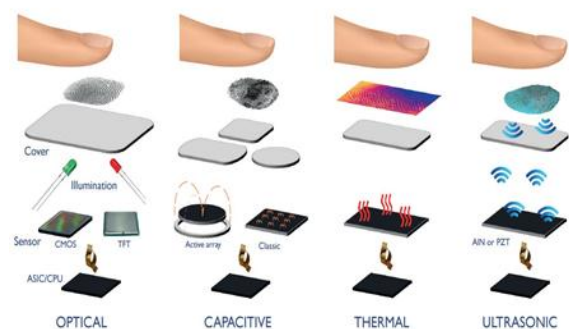
INPUT FINGERPRINT

Figure 1

- **IMAGE ACQUISITION STAGE:** The Image Acquisition stage is the process to obtain images by different ways. There are two ways to capture fingerprint image; online and offline. In the online fingerprint identification the optical fingerprint reader is used to capture the image of finger print. The size of fingerprint image will be 260* 300 pixels. The offline fingerprint identification is obtained by ink in the area of finger and then put a sheet of white paper on the fingerprint and finally scans the paper to get a digital image.

- **IMAGE PRE-PROCESSING STAGE:** The pre-processing stage is the process of removing unwanted data in the fingerprint image such as noise, reflection .etc. The fingerprint image pre-processing is used to increase the clarity of ridge structure. There are many steps for doing this, such as Image Segmentation, Binarization, Elimination of noise, smoothing and thinning which are used to enhance the fingerprint image. In [3], theGaussian filter, Short Time Fourier Transform analysis are adopted to enhance fingerprint image quality. In some cases thebinarized of fingerprint image contains some of false minutiae .In [4] . A detailed pre-processing is mentioned to remove false minutiae.

- **FEATURE EXTRACTION STAGE:** The feature extraction process of fingerprint image applied on the output of pre-processing stage. The process of feature extraction depends on set of algorithms. A fingerprint feature extraction program is to locate, measure and encode ridge endings and bifurcations in the fingerprint. There are various methods for extracting the features from the fingerprint image. The famous methods is minutiae extraction algorithm which is find the minutiae points and map their relative placement on the fingerprint .There are two types of minutiae points; Ridge ending and Ridge bifurcation.

Inthey are used an advanced method for extract feature from fingerprint whichdone by extract minutiae directly from original gray-level images without use binarization and thinning and they usegabor filter methods to extract features from fingerprint.

- **MATCHING STAGE**: The matching stage is the process to compare the acquired feature with the template in the database. In other words the process of matching stage is to calculate the degree of similarity between the input test image (for user when he wants to prove his/her identity) and a training image from database (the template which created at the time of enrolment). Matching can be done in three methods: hierarchical approach, classification approach and Coding approaches. The hierarchical approach is increases matching speed at the cost of accuracy.

V. TYPES OF FINGERPRINT SCANNER

A fingerprint sensor is an electronic device used to capture a digital image of the fingerprint pattern. The captured image is called a live scan. This live scan is digitally processed to create a biometric template (a collection of extracted features) which is stored and used for matching. Many technologies have been used including optical, capacitive, RF, thermal, piezoresistive, ultrasonic, piezoelectric, MEMS

Figure 2

1. **Optical readers** are the most common type of fi

ngerprint readers. The type of sensor in an optical reader is a digital camera that acquires a visual image of the fingerprint. Advantages are that optical readers start at very cheap prices. Disadvantages are that readings are impacted by dirty or marked fingers, and this type of fingerprint reader is easier to fool than others.

2. Capacitive readers, also referred to as CMOS readers, do not read the fingerprint using light. Instead a CMOS reader uses capacitors and thus electrical current to form an image of the fingerprint. CMOS readers are more expensive than optical readers, although they still come relatively cheap with prices starting well below 100 euro's. An important advantage of capacitive readers over optical readers is that a capacitive reader requires a real fingerprint shape rather than only a visual image. This makes CMOS readers harder to trick.

3. Ultrasound readers are the most recent type of fingerprint readers, they use high frequency sound waves to penetrate the epidermal (outer) layer of the skin. They read the fingerprint on the dermal skin layer, which eliminates the need for a clean, unscarred surface. All other types of fingerprint readers acquire an image of the outer surface, thus requiring hands to be cleaned and free of scars before read-out. This type of fingerprint reader is far more expensive than the first two, however due to their accuracy and the fact that they are difficult to fool the ultrasound readers are already very popular.

4. Thermal readers sense, on a contact surface, the difference of temperature in between fingerprint ridges and valleys. Thermal fingerprint readers have a number of disadvantages such as higher power consumption and a performance that depends on the environment temperature.

FINGERPRINT PATTERNS: Identifying the Different Types Easily

Every person in the world possesses a unique set of fingerprints. However, the differences between some can be very subtle. By studying the arrangement, shape, size, and number of lines in each fingerprint, experts have been able to classify them into unique patterns, which are used for identification. A person's weight, eye color, and hair color can change or be changed, but his fingerprints cannot be altered. They are unique to each individual, and can be differentiated and identified based on certain distinctive patterns made by the ridges. The following are some of the commonly used fingerprint patterns that have been identified and used in the process of fingerprinting.

There are basically three main forms of patterns that are made by the ridges of fingerprints.
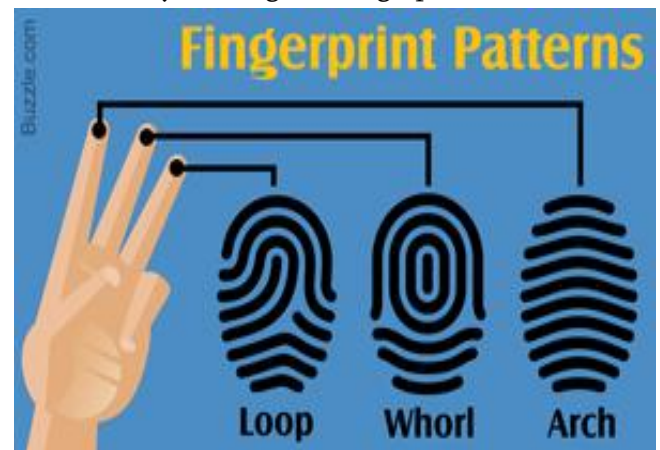
Figure 3

- **Loops**:
  Loops make up almost 70 percent of fingerprint patterns. They originate from one side of the finger, curve around or upward, before exiting out the other side. A loop pattern always comprises one delta, which is roughly a triangular formation in the pattern.

- **Arches:**
  Arches are encountered in only 5 percent of the patterns, and comprise lines that slope upward

and then down, similar to the outline of a small hill. There is generally no delta.

- **Whorls:**

  Whorls constitute around 25% percent of all patterns. They are circular or spiral patterns, similar to eddies. A pattern that contains 2 or more deltas will always be a whorl pattern.

There are many subtypes of these three basic finger print patterns Applications of fingerprint recognition

- Forensic scientist have used fingerprints in criminal investigation as a means of identification for centuries to find the criminal.
- A FINGERPRINT USER INTERFACEis a user interface that employs fingerprint recognition. Using the FUI, a user can specify different tasks by using different fingers for operating an input device. Since all fingers of a single person have unique fingerprint patterns, the finger used for the operation can be identified through the matching of the fingerprint patterns.
- Fingerprint is also used to identify a person for their properties {legal house paper, identity paper,etc.}. It was the old style of using fingerprint stamp insist of signature the people who were illiterate used to give their fingerprint stamp. It was moresecure than the signature because signature can be copied but fingerprint identification is unique for single person
- Nowadays, fingerprint identification is mostly used in the android phones in the security password for screen look, application lock, etc.
- It can be also used in the home security system by putting fingerprint system on the main door.
- The is widely used for the identification of a person that he/she belongs to the nation (country, city ,town.) that is .we can sayadhaarcard.
- Voter registrations and identification

- Border control via passport verification by using biological parameters
- Population census by using biometric
- Drivers license and professional ID card verification with biometric identities

Advantages and Disadvantages

As with all biometric system there are a number of advantages and disadvantages associated with using fingerprintscanning to confirm an individual's identity. Often weighingthe various benefits and costs associated with particularbiometric methods greatly affects which systems areimplemented by an organisation and in some cases,whetherbiometric systems are adopted at all. In the case of fingerprint scanning,the relative advantages and disadvantages arereasonably straightforward.

The advantages include
Acceptance

As most people are familiar with the use of fingerprinting for identification purpose it is generallyaccepted as a technology. Most people understand itsapplicability to access control.

Accuracy

By and large fingerprint technology is accurate.There is a small chance of rejection of a legitimate print i.e. there is a chance of accepting a false print or a chance of rejecting a legitimate print. The chances of accepting a falseprint are very low.

Ease of use

Very little time is required for enrolment witha fingerprint scanning system. Unlike other biometric devices such as retina scanners,fingerprint scanners do notrequire concentrated effort on the part of the user. Accordingly one could consider fingerprint scanning to berelatively nonintrusive.

Installation

Changes in technology have made fingerprintscanners relatively easy to install and inexpensive. Mostfingerprint scanners are now very small and portable. Plug-and-play technologies have made installation very easy.In many cases,the scanning device has been incorporatedintokeyboards,mouse buttons and even notebook computers.

Training

Due to the intuitive nature of scanningfingerprints, such devices require no training to use and little training to support.

Uniqueness

As noted previously,fingerprints are a unique identifier specific to the individual.

Security

Fingerprints cannot be lost or stolen,andare difficult to reproduce. Furthermore,storingfingerprinttemplates as statistical algorithms rather than completecopies ensures that the ability to reproduce these unique identifiers is significantly reduced.

The disadvantages include:

Acceptance

Although also an advantage,user acceptance isnot guaranteed. Fingerprint scanning crosses the fine linebetween the impersonal and nonintrusive nature of passwordsand personal identification numbers (PINs),and utilising partof an individual's body to identify him/her. As will bed is cussed some people view this as an invasion of privacyor worse.

Injury

Injury whether temporary or permanent,can interfere with the scanning process. In some casesre enrolment is required. For example,bandaging a finger fora short period of time can impact an individual if fingerprintscanning is used in a wide variety of situations. Something assimple as a burn to the identifying finger could prevent use of an automatic teller machine (ATM).

Others

In 2002, a Japanese cryptographer demonstrated how fingerprint recognition devices can be fooled 4 out of 5 times using a combination of low cunning, cheap kitchen supplies and a digital camera.

Conclusion

Identification can be done via various types of Biometric that are Fingerprint, iris, hand Geometry, Gestures, Signature etc. Within biometric methods, automatics Signature Recognition are an important research area due to the social, legal and wider acceptance of handwritten signature as means of identification. Offline Signature recognition system is used in the proposed model. Recognition decision is usually based on local or global features extracted from signature under processing. Excellent recognition results can be achieved by comparing the robust model of the query signature with all the user models using appropriate classifier. After the authentication of the signature, invisible watermark fingerprint recognisation is proceed by going through enhancement techniques which will improve the quality of the fingerprint, reduce the enhancement errors. Orientation point is extracted either by NLMS/INLMS which will help in matching accuracy by getting the optimal point.Then matching of both input image and output image will be carried out if the images are matched. Then it is authenticated otherwise authentication cannot be done. Hence High Recognition rate is first requirement of an effective signature recognition system which depends upon the techniques adopted in training and classification of signatures. It also depends on the extracted features. Among various stochastic approaches, HMMs have proven very effective in modelling both dynamic and static signals.

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A Review on IoT and Fingerprint Based Door Locking System

Prof M. Nasiruddin1, Prerna Kachhwaha2, Ankita Balpande2, Payal Bondre2, Mrunal Gawande2
[1]Associate Professor & HOD, Department of Electronics & Telecommunication Engineering, ACET, Sadar, Nagpur,
Maharashtra, India
[2]B.E. Student, Department of Electronics & Telecommunication Engineering, ACET, Sadar, Nagpur, Maharashtra,
India

ABSTRACT

The main idea of this paper is to suggest two ways for unlocking a door using Internet of Things (IoT) and Fingerprint. Security has always been a major concern for the households and the office environment, and for this concern various approaches are in place to address the problem. Most of the major door lock security systems have several loopholes which could be broken down to gain access to the desired places, and it creates a concern for a secure lifestyle and proper working environment[2]. Additionally, terrorism and unauthorized access to places have become a major issue now-a-days, and there is a need for a secure system to prevent unauthorized access especially in shared access environment. Recently, research on IoT systems for smart buildings has been attracting increasing attention[2]. Today, Internet of Things (IoT) is one of the promising solutions. The Internet of Things (IoT) is a system, combination of embedded controllers, sensors, software's and network. After internet and mobile communication the development of IoT can support a variety of applications including Intelligent Art, Intelligent Logistics, Intelligent Medicine & Healthcare, Intelligent Transportation, Intelligent Power, Smart Life etc[9]. The Internet is a worldwide system of interconnected computer networks. There are several ways that enable us to access the Internet. Technology is keep improving, method to access the Internet also increase. People can access Internet services by using their cell phone, laptop and various gadgets. IoT allows a number of objects that have been embedded with wired or wireless communication interfaces to automatically communicate and interact with each other[9]. The Internet is a technology that has greatly enhanced our lives. Fingerprint is a reliable biometric feature having a wide range of applications that require authentication[3]. Biometric systems such as fingerprint provide tools to enforce reliable logs of system transactions and protect an individual's right to privacy.

Keywords: IoT, Smartphone, Arduino UNO, Fingerprint Sensor,Biometric Systems

I. INTRODUCTION

These days office/corporate environment security is a major threat faced by every individual when away from home or at the home. Instead, He finds an alternative solution which provides better, reliable and atomized security. Among mainstream personal identification methods we mostly see password and identification cards techniques. But it is easy to hack password now and identification cards may get lost, thus making these methods quite unreliable[2]. Although in some places people use

smart cards, there might arise a situation when someone loses the card or keeps the card inside. These are some of the hassles that people might face when using keys or smart cards.

That is when our system, fingerprint based lock system comes into play. Our design is implemented to provide better securities as users don't need to remember passwords and don't need any sort of keys or cards that often get lost[2]. the internet is very common and is available everywhere and online all time due to its growth in the technology. The term "Internet of Things" (IoT) was first used in 1999 by British technology pioneer Kevin Ashton to describe a system in which objects in the physical world could be connected to the Internet by sensors[8]. Today, Internet of Things(IoT) is one of the promising solutions. The Internet of Things(IoT) is the network of physical objects— devices, vehicles, buildings and other items embedded with electronics, software, sensors, and network connectivity—that enables these objects to collect and exchange data. The concept of the Internet of Things (IoT) was proposed by the Auto-ID Laboratory of MIT in 1999 [6].The basic principle for establishing an IoT service involves connecting various smart objects into a human interactive network, enabling internet access for smart objects. Internet of Things (IoT) incorporates concepts from pervasive computing and enables. A system which is a Combination of Embedded controller, sensors, Software's and Network is called the Internet of Things (IoT).Thus, developing a method by which people can be provided with superior control over the internet and be informed of the status of interactive objects in the physical world will be the main focus of IoT[6]. Fingerprint lock system because fingerprint scanning is more accurate and cost effective method. It is also secure because fingerprint duplication is virtually

impossible. Additionally, we have also used password authentication system for security purposes to ensure access to not enrolled people. Fingerprints are one of many forms of biometrics, used to identify individuals and verify their identity. The analysis of fingerprints for matching purposes generally requires the comparison of several features of the print pattern[2].
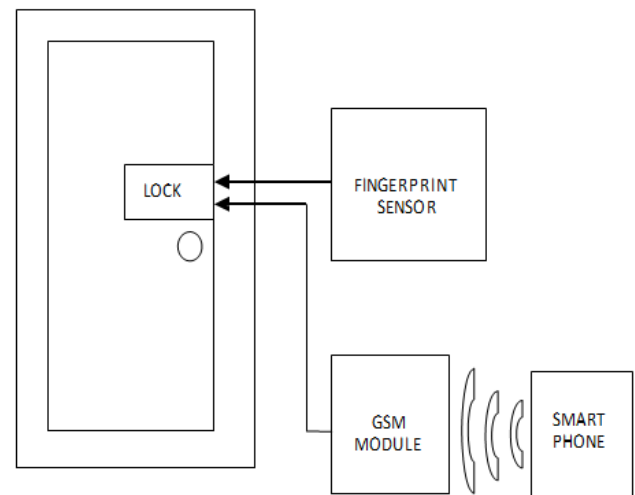
Figure 1. Implementation of IoT and Fingerprint Based Door Locking System.

In figure 1 there are two ways to control lock, first using Fingerprint sensor and second using GSM Module, Fingerprint sensor is used to sense finger then accordingly it will control the operation of door. The door can also be control by a Smartphone application to control the door[6].

II. METHODS AND MATERIAL

i. Hardware

1. To propose overall architecture for IoT and Fingerprint Based Door Locking System.
2. To design and implementation of door locking system.

3. Hardware implementation at back of door and fingerprint sensor.

ii. Software

1. To develop a C code for communication between Fingerprint sensor and Microcontroller in arduino IDE.
2. To develop an Smartphone Application in Java Language.

iii. Introduction to IoT and Fingerprint Based

Door Locking System

The Internet of Things (IoT) can be defined as a global infrastructure which combines intelligent services with situational awareness, and allows mutual communication between one thing and another, and between people and intelligent things over a network[6]. More recently, a variety of communication technologies have been fused to receive and provide information about things. Especially, IoT technologies have been enabled to communicate by the fusion of home appliances and mobile devices. The security currently become a very important issue in public or private institutions in which various security systems have been proposed and developed for some crucial processes. Security systems are vital for protection of information, property, and prevention from theft or crime. IoT is the network of physical objects, devices, buildings, vehicles and other items embedded sensors and network connectivity that enables using with electronics, software these objects to collect and exchange data [1]. As today fingerprint based system provides high degree of accuracy in terms security. Therefore, we have decided to introduce a system for locking which is based on the Fingerprint scanning. Our project basically, is a combination of Embedded Systems & Biometrics. An Embedded system is a combination of computer hardware and software Design

engineers optimized the size and characteristics of the microcontrollers. Biometrics refers to the automatic identification of a living person based on physiological or behavioural characteristics for authentication purpose. Among the existing biometric technologies are the face recognition ,fingerprint recognition, finger-geometry, hand geometry, iris recognition, vein recognition, voice recognition and signature recognition, Biometric method requires the physical presence of the person to be identified. Biometric recognition systems offer greater security and convenience than traditional methods of personal recognition. This system focuses on the use of fingerprints for door opening and closing[2,5]. generates output. Arduino control rotation of Servo Motor. Servo Motor Rotate Clockwise or Anticlockwise which control latch of door[3,6].
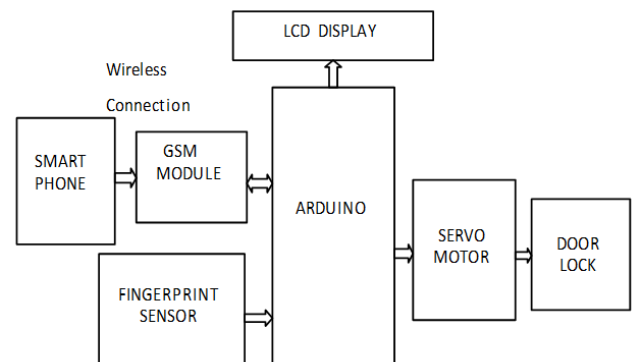
Figure 2. Basic Architecture of IoT and Fingerprint Based Door Locking System.

III. CONCLUSION

In our country, private and government organizations are very much concerned about security. The increasingly demand for intelligent The architecture as shown in figure 2, it consist of Smartphone, GSM Module, Fingerprint Sensor, Arduino Uno Board,LCD(Liquid Crystal Display) Servo Motor,& Door Lock. The GSM Module,

Arduino Uno Board, Servo Motor,& Door Lock are mounted behind the door, remaining Fingerprint Sensor is to be placed at front side of door. As Smartphone is a portable device we can control the operation of door remotely from anywhere in the world. Smartphone consist of an Application which will control the operation of door lock, if "Open" switch is pressed then door will open and if "Close" switch is pressed the door remains closed. Smartphone communicate with GSM Module wirelessly[6]. Similarly Fingerprint sensor also control the operation of door lock, if Fingerprint of authorized person is placed sensor will detect then door will open and if Fingerprint of unauthorized person is placed sensor will not detect and door will remains closed. Fingerprint sensor compare the fingerprint which is placed with the stored fingerprints. It consist of memory which store fingerprints. Arduino Uno is a microcontroller, the program dumped on the Arduino accordingly it industry solutions based on IoT will drive more opportunities for the companies that take advantage of the IoT.[5] Because of the advancements in sensing, identification, and network communication technologies, the diverse services have been gradually extended from internet to the IoT. IoT-based service provides human with obtaining and controlling the status of the smart object through internet. Fingerprint sensors may be placed at the various access points in the buildings to control. For fingerprint matching, a user only needs to place the finger (or thumb) on the scanner, an image is scanned, which is then compared against the templates already stored in the database[6]. Our proposed two way IoT and fingerprint based lock system is a reliable and very secure lock that will not only ensure safer environment but also ease lifestyle. This system can prove very useful in housing buildings, large offices, universities and so on[2].

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FPGA Based Security System

Krishna Shahu¹, Purva Koliya¹, Anshita Jaiswal¹, Vedashree Khanke¹ ,Prof. Akbar Nagani²
¹U.G. Student, Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur University,
Nagpur, Maharashtra, India
²Asst. Prof. , Electronics & Telecommunication Engineering, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur,
Maharashtra, India

ABSTRACT

Security and power efficiency is the most important thing in present day situation. Need of security and saving of power is increasing rapidly. Security system becomes the best solution to overcome the intrusion problem. This project focuses on the security system which is controlled using FPGA programmed by VHDL language. Field Programmable Gate Array (FPGA) delivers breakout performance capacity and most power efficient system integration while optimizing to develop FPGA devices based on CAD tools in the Hardware Description Language (HDL). The overall project is divided into two parts. The first part is concerned with the hardware development. The second part is based on software programming to operate the hardware structure. PIR motion detectors are most frequently used for security devices. Surveillance is the monitoring of the location, behaviour or activities for the purpose of directing, managing and detecting intrusion by means of electronic equipment. Passive IR motion detectors are usually designed to provide an indication to an alarm panel in response to detecting IR that is indicative of motion of the object. The alarm panel is responsive to receipt of the breach indication to cause an alarm condition to occur. PIR motion detectors are commonly used in conjunction with indoor or outdoor to turn on a light in response to a person moving in the field of view monitored by the motion detector. PIR sensor is capable to detect motion while the programmed FPGA is capable to control the whole operation of the security system.
Keywords: Security, FPGA, Video Surveillance, PIR Sensor

I. INTRODUCTION

As FPGAs have become larger and more capable, the value of the IP of the application designs has grown, motivating significant investment in built-in security functions. Further, the value of the data handled by the FPGA has also increased significantly, including such information as decrypted digital cinema and personal-data databases. As a result, today we find FPGAs deployed in a security hostile environment, protecting data of great commercial value. Besides this measures were also taken to improve protocols and implementations to secure designs in the field. These include not only cryptography on the configuration files but also development of fault tolerant design methodologies for the base array and for applications. Design of automated video

surveillance systems is one of the exigent missions in computer vision community because of their ability to automatically select frames of interest in incoming video streams based on motion detection. This paper focuses on the real-time hardware implementation of a motion detection algorithm for such vision based automated surveillance systems Today, FPGA security is strong enough that they are deployed in security-sensitive applications in commercial and government systems.

II. IMPLEMENTATION OF FPGA BASED SECURITY SYSTEM
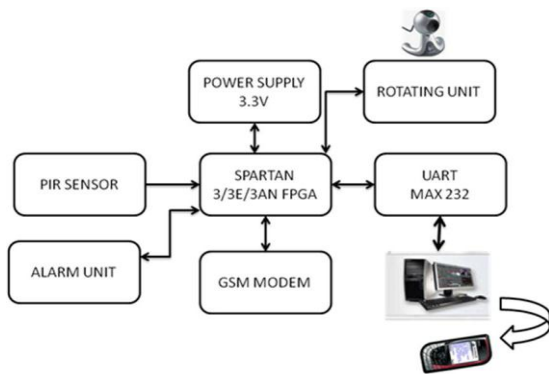
Figure 1

When a person enters a monitored area, the target is monitored by sensors which include PIR sensors. These are used to detect motion of the person. Passive infrared sensors (PIR) are electronic devices which are used in some security alarm systems to detect motion of an infrared emitting source, usually a human body.

The pyro-electric sensor is made of a crystalline material that generates a surface electric charge when exposed to heat in the form of infrared radiation. Someone enters secured places, Spartan3an FPGA Starter Kit immediately send SMS for the corresponding people through GSM modem.

The FPGA is more advantageous compare to other models due to its re-configurability and its parallel processing. The GSM modem is connected to the FPGA through serial cable. The people can understood something happens in host section, when they receive message. UART MAX232 stands for Universal Asynchronous Receiver/Transmitter which can be used to receive data from the server through the serial cable.

If user response is received in default time, the system will be in user control mode, where user can establish a remote connection to observe the target area and make relevant control with the help of rotating unit called stepper motor. According to the instructions given through the mobile, then the corresponding operations performed by stepper motor will be rotated either in clockwise or in anti-clockwise. At the same time camera keep on capturing images at the host place and saved into the computer.

III. RESULTS AND DISCUSSION

Figure 2

A. Pir Sensor Interfacing With Fpga

Most PIR modules have a 3-pin connection at the side or bottom. The pin-out may vary between modules so triple-check the pin-out! It's often silk screened on right next to the connection. One pin will be ground, another will be signal and the final one will be power. Power is usually 3-5VDC input

but may be as high as 12V. Sometimes larger modules don't have direct output and instead just operate a relay in which case there is ground, power and the two switch connections. The output of some relays may be 'open collector' – that means it requires a pull-up resistor. An easy way of prototyping with PIR sensors is to connect it to a breadboard since the connection port is 0.1" spacing. Some PIRs come with header on them already; the ones from Ad fruit don't as usually the header is useless to plug into a breadboard. By soldering in 0.1" right angle header, a PIR is easily installed into a breadboard. PIR sensors are rather generic and for the most part vary only in price and sensitivity.

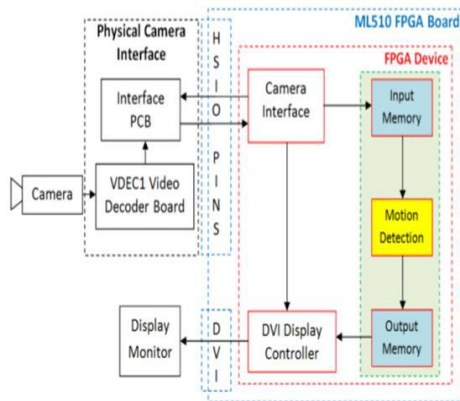## B. Camera Interfacing With Fpga

Figure 3. Dataflow Diagram of the Proposed and Developed Motion Detection System.

In current surveillance scenario, motion detection is one component of a potentially complex automated video surveillance system, intended to be used as a standalone system. Therefore, in addition to being accurate and robust, a successful motion detection technique must also be economic in the use of computational resources on FPGA development platform. This is because many other complex algorithms of an automated video surveillance system also run on the same FPGA platform. The problem of motion detection can be stated as "given a set of images of the same scene taken at several different times, the goal of motion detection is to identify the set of pixels that are significantly different between the last image of the sequence and the previous images".

In order to achieve real-time performance, as required in an automated video surveillance system, we have proposed a dedicated hardware architecture for clustering-based motion detection scheme and its implementation as a prototype system using the Spartan3an FPGA board for real-time motion detection. A simplified conceptual block diagram of the proposed and developed FPGA-based motion detection system is shown in figure to illustrate the data flow within the system. The main components of a complete FPGA-based standalone motion detection security system are: analog Camera, VDEC1 Video Decoder Board for analog to digital video conversion, custom designed Interface PCB, Spartan3an FPGA platform for performing real-time motion detection, and a display device (Display Monitor).

C. Ethernet Interfacing With Fpga

Our application implemented on the FPGA works in this simple example with primarily four registers, referred to as R0, R1, R2, R3. These registers provide the storage space for communicating with the host, and are associated with four different channels of the communication between host and FPGA. From the host, writes to R0 are simply displayed on the Atlys board's eight LEDs. Reads from R0 return the state of the board's eight slide switches. Writes to R1, R2, and R3 are registered and may be read back. The circuit implemented on the FPGA simply multiplies the R1 with R2 and places the result in R3. A simplified block diagram of the entire system (host + FPGA) is shown in the Figure 2 below.
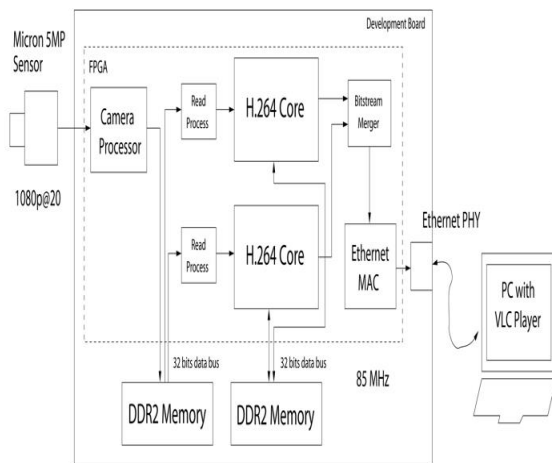
Figure 4

IV. CONCLUSION

Security is the art of restricting admittance to certain entities and is a huge concern for our global society. So in this paper we present the FPGA based security system using with the help of Xilinx ISE design. The design is verified or tested on the FPGA SPARTAN3 Board. We desired to innovate a security system assembled using VLSI technology that would be affordable in order to appeal to the general public, reliable in order to operate without failure, effective in order to provide a sense of security. Hence we are using FPGA for building our security system as it provides reliability, flexibility and low power consumption. It can be used in office for automatic door close system. The system can be used for automatic switching of street lights according to availability of daylight. It can also be used in automatic door lock system in houses, cars and offices after fixed time slot or fix duration. It can be used in remote interface which give a more reliable program. It is also use in industry in many applications. By adding video camera (for cost effective purpose), this system can be used as low cost home security system for apartments. We can provide 6V, 4 or 5 Ah battery back up to our system so that in case of power failure our project works properly. On the whole, this system is used in numerous applications like in Military, Medical Equipments, Home security system, Car security etc. Due to this security System, we can protect our system or documents.

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A Review on Power Distribution Scheme Using Smart Meter

Vrushali B. Shende¹, Tejaswini S. Powale¹, Yogesh P. Bawangade¹, Prof. M. D. Ghatole²
¹UG Scholar, Electrical Engineering, DES's COET, Dhamangaon (Rly.), Maharashtra, India
²Assistant Professor, Electrical Engineering, DES's COET, Dhamangaon (Rly.), Maharashtra, India

ABSTRACT

Smart meters, are the core part of smart grid system, it is active field of research for its huge potential in efficient power distribution and load management. In this work, different economic energy consumption schemes for consumers and power outage reduction schemes for distribution utility companies using smart meter are provided which will improve the quality of service.

Additionally, several energy management schemes that are applicable at customer and distributor end are also provided. This includes keeping the monthly bill within a preset limit and being notified of tariff slabs as energy is being consumed. The proposed techniques further include energy consumption within the assigned load limit or sanctioned load. By implementing these techniques it is possible to minimize the existing power outage problems and to provide uninterrupted power at a useful level. These schemes provide economic benefit to the consumer and an effective load management strategy for distribution companies.

Keywords: Implementation Factors, Power Management, Power Outage Reduction, Smart Mete

I. INTRODUCTION

Smart grid is an efficient and effective power transmission and distribution system. Smart meters at customer areas represent the core part of the intelligence and automatic control system of smart grid infrastructure. Smart meters are used in cost effective energy management schemes for consumers and power distribution companies. Where there is a large deficit between energy generation and demand, smart meters offer the potential of providing economic usage of energy for customers and smart management of distribution system so as to reduce the impact of the energy deficit. With increase in energy tariff attached with energy deficit, customers will look for possibilities to reduce their electricity costs and expecting a good quality of service from the distribution companies. By installing smart meters at the customer areas, customers can use various options to optimize electricity usage and minimize energy expense.

These energy management schemes are applicable at customer as well as distributor end also. This includes keeping the monthly bill within a preset limit and informed about the tariff slabs to the consumers. The proposed techniques further include energy consumption within the assigned load limit or sanctioned load. Additionally, it is possible by implementing the proposed techniques

to reduce existing power outage problems and to provide uninterrupted power to the consumers.

II. SMART METER FOR ECONOMIC ENERGY USAGE

The permissible daily limit consumers can regulate his/her energy usage by using smart meter based usage management schemes which are as follow:

1. Fixed budget for electric bill,
2. Electricity cost management according to price slabs, and
3. Sanctioned load monitoring.
4. Above schemes are described in details in the following subsections.

2.1: Fixed Budget for Electric Bill

A smart meter can be used to help the consumer to plan a monthly budget for electricity usage. The consumer will give his/her allocated budget as an input to the meter and the meter will calculate the available energy units based on the current tariff rate. Based on the available units, the meter will calculate the daily average permissible unit. For each day, the meter will determine the consumed energy units for that day and raise an alarm if that consumed energy is higher than the regular value. Thus, the consumer will be informed of his/her daily position on consumed energy units and will regulate the energy consumption for the remaining days of the month so that the total consumed energy is within the selected budget set at the start of the month.

2.2: Electricity Cost Management According To Price Slabs

If the distribution utility company will define the tariff rates in increasing order for the consumption of electricity as shown in below table:

As per this tariff structure, the consumers will have to pay higher tariff rates in increasing order as his energy consumption increases and crosses over to the higher price slabs. By using smart meters the customers will become more energy conscious as it can provides the alerts to consumers when the energy consumption is goes towards the next higher tariff rate. By using the smart meters the customers can keep their energy consumption within an allowable limit.

Table 1. Price Slabs for Energy Consumption in Increasing Order

Category	Per Unit Rate(Rs.)
Life Line: From 1 To 50 Units	2.5
First Step: From 1 To 75 Units	3.5
Second Step: From 76 To 200 Units	5.8
Third Step: From 201 To 300 Units	7.2
Fourth Step: From 301 To 400 Units	7.8
Fifth Step: From 401 To 600	8
Sixth Step: A 600 Units	9.1

2.3: Sanctioned Load Monitoring

The customers of power distribution companies are allotted numerous levels of allowable sanctioned loads according to their demands whenever they promise to a particular company. The sanctioned load involves a assumed agreement that customer will not cross the sanctioned load. However, there is no facility for watching in work customer loads and penalty for above the sanctioned load.

III. POWER OUTAGE REDUCTION

Where there is a shortage of electricity production then the gap between production and demand can be minimize by power outage. In the urban areas, the power outage is usually planned by the electricity distribution companies where an alternating hourly pattern of availability of electricity and power outage (termed load shedding) is maintained. The outage situations in rural areas is even poorer as generated electricity is mainly directed toward city and industry areas gives less priority to rural areas.

3.1: Block diagram

Figure 1(A) shows block diagram of wireless implementation and Figure 1 (B) shows the block diagram of wired implementation for proposed load management scheme.

The communication link to support power outage management can be employed by using the wireless or wired arrangement. For wireless implementations, modems are required at the smart meters to set up the link, a local concentrator is used to aggregate the data from multiple smart meters and relays are used for channelize the data to the central substation. As the data rate is likely to low to support the scheme.
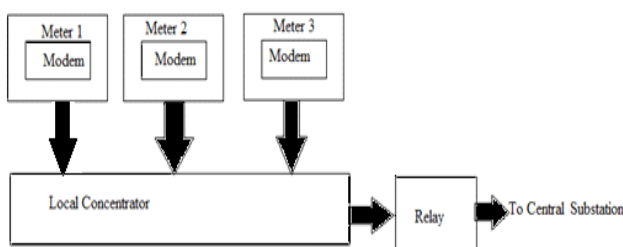
Figure 1(A). Wireless Implementation
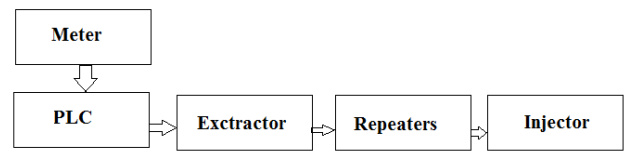
Figure 1(B). Wired Implementation

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Detection of inrush current using Wavelet Transform and Artificial Neural Network (ANN)

Swapnil Misal[1], Avesh Siddhique[1] ,Zeenat Sheikh[1], Vivian wasnik[1] ,Dr Altaf Badar[2]

[1]Student ,Anjuman college of Engineering & Technology, Nagpur, Maharashtra, India

[2]Electrical Department , Anjuman college of Engineering & Technology , Nagpur, Maharashtra, India

ABSTRACT

Transformer Starting current's initial cycle i.e inrush currents are high magnitude, harmonic-rich currents generated when transformer cores are driven into saturation during energization. In this paper an effective method of detecting of inrush current in distribution transformer based on wavelet transform is presented. Using this method inrush current can be distinguished from other currents. Inrush current data and other transients are obtained by simulation using MATLAB. Results show that the proposed procedure is efficient in identifying inrush current from other events.

I. INTRODUCTION

M. Gong.et.al. [1] Presents method of transformer differential protection. As inrush current causes many faults in transformer. WT and neural network is used to analyze the single phase signals of inrush current. The simulation of short circuit current and inrush current is done by PSCAD/EMTDC software. A 360MVA, 220/35kv is used. Generally the action time of protection is approximately 14ms where wavelet neural network analyze it in 10ms.

M. Naderi.et.al. [2] Introduces wavelet transform for identifying partial discharge signals. It is very complicated task to identify partial discharge signals in transformer. 66KV/25MVA transformer with fully interleaved winding and connected tap winding is used as a test object. This method gives partial discharge distortion in a level which gives

chance of applying the result in de-noised signals to localize partial discharge in transformer winding.

I. Wahyudi.et.al. [3] Develops wavelet transform for filtering harmonic currents and the results are classified by using probabilistic neural network (PNN). In this method single phase power transformer 25KVA dry-type transformer, voltage rating is 7200V /240V /120Vand the frequency is 60Hz with a load that varies is used. Wavelet transform separates fundamental signal and noise signal whereas the PNN does classification of each transformer.

O.A. Mohammad.et.al. [4] Improved method for understanding the behavior of harmonic currents and dc currents using wavelet packet transform algorithm (WPT). This method allow physical representation of the behavior of nonlinear magnetization and frequency dependence of the transformer. In this technique 3-phase, 150-KVA,

240/120 V, 60 Hz transformer is used. An ability to quantify different types of disturbances is done by concluded WPT analysis.

H. Ashfaq and M.N. Quadri [5] Introduces wavelet transform which analyze type of fault as well as approximate change in wave shape causes by fault occurrences. The types of fault are classified on the basis of characteristics nature. In this method generator and 3-phase power transformer rating is 30 MVA, 132 KV and 25 MVA, 132/66 KV respectively is used. The wavelet transform has ability to extracted information from transient signals simultaneously in the time and frequency domain.

E. Zahab.et.al. [6] Proposed method for incipient fault in power transformer which cannot be done by traditional protection. In this method simulation is done by using Alternative Transient Program (ATP) for recognizing incipient fault in transformer. Wavelet packet transform (WPT) is develop to measure RMS value of the harmonics content in a signal. The 3-phase power transformer which has 72/13.8 KV, 66 MVA, 50 Hz rating is used for simulation work.The proposed technique can be applied to any power transformer without using hardware.

Y-Y Hong and P-C Chian [7] illustrates the application of wavelet transform for detectingfault current occurrence time and recognizing all saturation periods in Current Transformer (CT). The simulation work is carried out on MATLAB/SIMULINK software. In this method the sampling rating of transformer frequency is 7680Hz. This method reduces training time as the limited sample points per cycle are used as inputs for MFNNs. The online time of computation is reduces.

B.L. Nayak [8] describes Discrete Wavelet Transform (DWT) for classifying the fault current occurring in transformer. The simulation is done by using MATLAB-SIMULINK software. The decomposition and reconstruction is straightforward. This method reduces commutating time as well as memory space.

M.M. Ansari.et.al. [9] Presents Discrete Wavelet Transform (DWT) for characterizing and discriminating the transient arising from magnetization and inter-turns fault in transformer. The single phase transformer of the rating 2KVA, 230Vis used in this method. This method provides predictive maintenance to the transformer.

M.S. Naderi.et.al. [10] Shows a technique for extracting Partial Discharge (PD) signals. The technique is employed for evaluating electrical measured partial discharges by wavelet transform. The 66KV, 25MVA fully interleaved winding of a power transformer is used in this system. This method is achieving acceptable levels of noise suppression.

K. Prakasam.et.al. [11] Introduces the method of very fast transient over voltages of 132KV caused by switching operation. The simulation work is carried out by MATLAB software. 132KV power transformer is used in this study. The error evaluated by using both conventional as well as wavelet transform is 2.66% in magnitude of VFTOs and 5.3% in rise time.

F. Zeng.et.al. [12] Describes the Empirical Mode Decomposition (EMD) which discriminating the inrush current from internal fault of power transformer. The three phase power transformer is used in this technique. This method is convenient for distinguishing fault conditions and normal air drop.

J. Azarakhsh [13] represents the differential protection technique used in the power transformer. The learned decision tree is used for detecting type of fault. The simulation of power system and differential relay is carried out using PSCAD and MATLAB. In this technique 3- phase, 230KV, 50Hz transformer is used. The design relay has high speed and good performance which is essential for protection of power transformer. The time of detecting fault is few milliseconds and its maximum time of fault detecting is less than 10 milliseconds.

S.R. Paraskar.et.al. [14] States the algorithm for inrush current and fault using artificial neural network (ANN) in transformer. The technique used to identify fault in transformer since it has better monitoring capability. The location of fault is determined by discrete wavelet transform (DWT) and ANN. This method is study by using 220V, 2MVA, 50Hz single phase transformer is used. ANN takes less than one cycle for identifying the events.

K. Ramesh and M. Sushma [15] Presents the fault classification in a transformer. The technique applied wavelet transform. 138 KV, 50 Hz, three phase power transformer is simulated using MATLAB. The proposed method reduces data size without losing its distinguishing characteristics.

S.R. Huang.et.al. [16] Discusses the phenomenon of fault current and inrush current in transformer. This method presents technique for identifying fault current as well as inrush current in transformer by using Jiles-Atherton theory. In this technique 3-phase 11KV /20MVA transformer is used. The proposed method shows difference between inrush current and incipient fault current. Omar A.S.Youssef[17] Discriminates between faults and inrush current in transformer. This paper

presents the development of a wavelet based scheme , for distinguishing between transformer inrush currents and power system fault current by using MATLAB. A 132/l 1 kV, transformer connected to a 132 kV power system were simulated using the EMTP. The proposed scheme proved to be reliable , accurate and fast.

J. Pihler, B. Grcar.et.al. [18] suggests the improvement of power transformer protection using Artificial Neural Network. The paper suggests the possibility of improving digital power transformer protection. ANN was included in the protection algorithm as an extendon of the existing methods, which improved the reliability of the protection operation. The paper presents the digital protection algorithm completed in this way and the laboratory equipment by means of which experimental results were obtained. The results confirm faster and more reliable recognition of transfor- mer inrush, as well as satisfactory reconstruction of the distorted secondary CT currents.

G.Mokryani , P.Siano,A.Piccolo [19] suggest the detection of inrush current by using wavelet transform and probabilistic Neural Network. The paper had an efficient method for detection of inrush current from other transient currents.

Inrush current data and other transients are obtained by simulation using EMTP program. Results show that the proposed procedure is efficient in identifying inrush current from other events.

Suri Babu Miriyala .et.al [20] suggests the protection of power transformer from various faults. The protection is required for power transformers

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i.e. mainly against inrush currents, internal faults and external faults.

Identification of transients is very fast and accurate the research proposes to develop a new wavelet method to identify inrush currents to distinguish it from power system faults. The proposed algorithm extract faults and inrush generated transient signals using wavelet transform. The output signal of the wavelet transform classifies the transients.

S. A. Saleh.et.al [21] suggest the protection of transformer by using wavelet transform. This paper introduces a novel current diagnosis and protection technique, which is based on a Wavelet Packet Dansform (WPT). An experimental setup is developed and the proposed WPT technique is tested on-line on a three-phase laboratory power transformer. The WPT technique performed successfully by identifying different currents including magnetizing inrush, normal current (through- fault) and different internal faults currents.

Anupam Sinha .et.al[22] suggest the method of differentiating inrush current and other internal current. The false tripping of the relay takes place so to avoid it some other methods which can also be used for proper distinction between inrush current and internal fault current are highlighted in this paper. Some other methods were highlighted and conclusion were took out.

J.P. Patra [23] discusses the transformer magnetizing fault detection in power transformer . This paper discusses the different types of inrush phenomenon in power transformer. This paper shows study fault pattern by the aid of world's most popular environment, that is MATLAB- SIMULINK and also discusses some of its advantages.

Mrs. S. Poornima[24] Compares of CWT & DWT based Algorithms for protection of power transformer. The paper shows the development of CWT and DWT based preprocessing units to extract distinguishing attributes from inrush and internals fault signals. Proposed scheme in paper achieves proper classification with high discrimination rate and least error, avoiding false tripping of power transformer.

M. Mujtahid Ansari.et.al[25] Paper shows for Fault Diagnosis in Transformer by Discrete Wavelet Transform. The detection method can provide information to predict fault ahead in time so as that necessary corrective actions are taken to prevent outages and reduce down time. Tests are performed on 2KVA, 230/230Volt custom built single phase transformer. The results are found using Discrete and conclusion presented.

YU-PING LU.et.al[26] Paper shows magnetizing inrush detection in digital differential protection for large transformer. The paper based onmulti-condition restraint which introduces voltage features as a criterion .The results show the advantages in comparing with traditional second harmonic restraint method. This intelligent scheme can meet the requirements for large transformer protection.

K. Sheshyekani.et.al[27] Paper shows the discrimination between fault and inrush current. the discrete wavelet transform has been used to extract the energy of the signal at 15 resolution levels.These paper shows energy profile of wavelet decomposition levels leads to the accurate discrimination between fault and inrush current.

MA Jing.et.al[28]Paper shows the discrimination between fault and inrush current using Mathematical Morphology. the inrush current and short circuit current caused by internal fault on the basis of sudden changes detection using novel morphological gradient (NMG), transient current signals are then extracted by use of morphological opening and closing transform.

The results indicate that the proposed technique can also deal with the sampled data contaminated with various kinds of noises and DC components and is stable during internal faults with external shunt capacitance in a long EHV transmission line.

Xiangning Lin.et.al[29] This Paper shows the identification of inrush current. The identification is done by wavelet packet algorithm transform. Test results with the sampled data from r prototype device on a dynamic power system model verify the effectiveness of the proposed scheme.

S.Sudha.et.al[30] The paper suggest the relaying for protection of power transformer. The wavelet transform is applied first to decompose the current signals of the power transformer into a series of detailed wavelet components. A typical 750 MVA, 27/420KV, /Y power transformer connected between a 27KV source atthe sending end and a 420KV transmission line connected to an infinite bus power system at thereceiving end were simulated using PSCAD/EMTDC software.

II. CONCLUSION

The work carried out in this paper has been concentrated on implementing an effect algorithm for the classification of faults in the transformer. Wavelet analysis, an entirely new approach is presented for the detection of inrush current in transformer. The wavelet transform is performed on different currents recorded for various types of faults.

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A Review on Urban Air Pollution Monitoring System with Forecasting Model

Roshni Jeswani[1], Mohd. Tahseenul Hasan[2]

[1]Student, Electronics and Communication, RTMNU, ACET, Nagpur, Maharashtra, India

[2]Assistant Professor, Electronics and Telecommunication, RTMNU, ACET, Nagpur, Maharashtra, India

ABSTRACT

In this paper the system for monitoring and forecasting urban air pollution is presented. The system uses low-cost air-quality monitoring motes that are equipped with an array of gaseous and meteorological sensors. These mote wirelessly communicate to an intelligent sensing platform that consists of several modules. These modules are responsible for receiving and storing the data, preprocessing and converting the data into useful information, forecasting the pollutants based on historical information, and finally presenting the acquired information through different channels, such a mobile application, Web portal, and short message service. This paper focus is on the monitoring system and its forecasting module. Three machine learning (ML) algorithms are investigated to build accurate forecasting models for one-step and multi-step ahead of concentrations of ground-level ozone (O_3), nitrogen di oxide (NO_2), and sulfur dioxide (SO_2), carbon dioxide (CO_2). Rapid urbanization and industrialization has result in a sustained degradation of environmental quality parameters. It is important to keep track of various environmental pollution indices so that realistic models can be developed and relevant public policies can be created. Traditional methods for air pollution measurement are expensive and have a spatial constraint. With these limitations, air pollution monitoring broader area is not feasible. We used the modern low-cost sensors in conjunction with wireless sensor network (WAN) creates an opportunity to collect real time data from different locations and provide detailed pollution map. The main aim of this project is to develop a low cost multi-sensor node for air pollution measurement. The outcome of this paper can be significantly useful for alarming applications in areas with high air pollution levels.

Keywords: Air pollution monitoring system, forecasting, machine learning approach.

I. INTRODUCTION

Air quality is one of the major environmental problem for people, because of its direct influence on the state of human health. In this application both the interface and the computation complexity required the use of new and powerful computer paradigms. In the use of expert systems and agents has supplied a valid solution to improve complex acquiring-tasks about suitable parameters. The interest and the attention devoted to the environmental thematic, to the monitoring and to control activities about air quality, are growing quickly Environmental National Agencies are imposing the implementation of environmental monitoring stations located in a wide geographic area, in order to supply representative real data related to the atmospheric pollution processes

characterize the causes determining the pollution phenomena [18].Across the world, increasing population and rapid industrialization has caused significant environmental degradation. It ranges across air, water, noise and land pollution. Carbon Monoxide (CO), Carbon Dioxide (CO2),Nitrogen Dioxide (NO2), Sulfur Dioxide (SO2), Particulate Matter (PM), Lead (pb) ,Ammonia (NH3), Ground level Ozone (O3) are the primary cause of air pollution. Development of air pollution monitoring system will be beneficial to control and measure pollution related parameters. Conventional strategies for measurement of air pollution parameters are more precise yet expensive and restricted to spatial area, it is not possible to deploy measurement instruments in large number. In remote locations i.e. glaciers where less or no network connectivity is found then data communication and collection becomes major issue. Because of the communication issue, data needs to be collected manually at fixed location which is time consuming [14]. Many studies on human health have concluded that environmental stress is a major factor for morbidity and has a negative impact on the quality of life especially in urban areas (e.g.).One of the major challenges in these studies is to obtain or estimate high resolution (spatial and temporal) air quality data to be able to analyze the correlation between health and the exact air to which people are exposed. Among all the airborne pollutants (Sox, NOx ,CO, NH3 O3, etc.). Recently there has been a growing attention to study particulate matters due to their significant adverse impact on human health. In urban environments, this measure is closely linked to urban traffic conditions [8]. Recent development of electronics has realized the vision of using wireless communication in devices used for monitoring wide range of real life parameters, such as temperature, pressure, and air pollution. These devices send their measurements wirelessly to a database hosted on a remote server for further processing and analysis. The concept of using small size, inexpensive motes that wirelessly communicate their air pollution measurements has been widely studied and implemented [2].

II. AIR POLLUTION MONITORING SYSTEM

Air pollution attracts extensive attention worldwide due to its tremendous impacts on human health, global environment and economy. Conventional monitoring systems have been deployed to provide authorized information for urban management and environmental improvement. These systems have extremely low spatial and temporal resolutions and are inadequate for monitoring personal and acute exposures to air pollutants [1].

This paper describes the implementation and evaluation of an Air Pollution Monitoring System (APMS) for monitoring the air pollution using a WSN; this also constitutes the main contribution of this work. More specifically, in March 2015, a dense sensor network composed of 10 sensor nodes has been installed in a vibrant part of the city, covering an area of approximately 1 km2, equipped with sensors for measuring temperature, humidity, noise, light, CO2, CO, NO2, O3 and PM10. The data from the sensors is collected wirelessly every 30 min through a gateway and stored in a database. A web interface has also been designed for providing easy access and viewing of the sensor data. In the paper, we describe the various parts of the system in terms software using MATLAB. We detail the installation procedure with particular emphasis on the method used for calibrating the sensors. Finally, we offer some preliminary findings in comparing the sensor readings between the

different nodes. Our primary purpose in this paper is to share our experiences in applying WSNs technology for the problem of air pollution monitoring in an urban environment. Towards this end, we explain the various design choices involved as well as the problems and difficulties we encountered along the way. "Air Cloud System" is proposed, composed of personal low-cost internet-connected particulate matter (PM) sensor monitors and an air quality modelling engine providing accurate device calibration and fine-granularity estimation based on GPS-location. In Mauritus, investigates the use of a Wireless Sensor Network for air pollution monitoring. It also describes data aggregation algorithms for eliminating duplicates and summarising data into a simpler form. In, the implementation of a low cost air quality monitoring solution in Lahore, Pakistan is described, as part of the VIEW (Volunteer Internet-based Environment Watch) project. The feasibility of low cost electromechanical sensors for monitoring urban air quality is further demonstrated. The authors provide evidence for the performance of electrochemical sensors in the parts-per-billion (ppb) level for gas species (NO, NO2 and CO) and outline results from deployments of static networks of such sensor nodes and mobile networks for quantifying personal exposure in Cambridge, UK. In Japan, describes the development and calibration of a gas sensor system (NO2) to be used as a sensing node to form a dense real-time environmental monitoring network.

III. FORECASTING

Forecasting is the process of making predictions of the future based on past and present data and most commonly by analysis of trends. A common place example might be estimation of some variable of interest at some specified future date. Prediction is a similar, but more general term. Both might refer to formal statistical methods employing time series , cross-sectional or longitudinal data, or alternatively to less formal judgmental methods. Usage can differ between areas of application: for example, in hydrology the terms "forecast" and "forecasting" are sometimes reserved for estimates of values at certain specific future times, while the term "prediction" is used for more general estimates, such as the number of times floods will occur over a long period. Risk and uncertainty are central to forecasting and prediction; it is generally considered good practice to indicate the degree of uncertainty attaching to forecasts. In any case, the data must be up to date in order for the forecast to be as accurate as possible. In some cases the data used to predict the independent variable is itself forecasted.

IV. MACHINE LEARNING APPROACH

ML involves computational methods that improve the performance of mechanizing the acquisition of knowledge from experience. Machines learn from complex data to be able to solve problems, answer questions and be more intelligent. One of the tasks that highly involve learning is forecasting, in which the forecasting model is built through training from data that is generally nonlinear in the case of air quality. Therefore, approached based on linear modeling may not be suitable for such data . After training, the model is ready to predict unseen data and hence can answer the forecasting question, for example: "What will be the next hour value of NO2 gas concentration in air?" Specifically, we aim to accurately predict concentrations of O3, NO2, and SO2 as they are considered to be the most harmful gases. Before employing the nonlinear modelling methods, the nonlinear structure of the data is verified for all gases. Brocke-Decherte-Scheinkman

(BDS) is used. The BDS statistic, ωm,n(ε), is computed and the nonlinearity in data is verified if the null hypothesis of linearity is rejected at the 5% significance level. This condition is applicable if |ωm,n(ε)| > 1.96. If the time series data comprises more than 7500 observations, as in our case, the BDS statistic is derived in terms of the correlation integral, cm,n(ε), using the formula:

$$\omega_{m,n}(\varepsilon) = \sqrt{n}\frac{c_{m,n}(\varepsilon) - c_{1,n}^{m}(\varepsilon)}{\sigma_{m,n}(\varepsilon)}$$

Where n is the sample size (8832 observations for all gases, in our case), m is the embedding dimension and it takes a discrete value in the range [2]–[5] at the big sample size σ is the standard deviation of time series and ε takes a recommended value in the range from 0.5σ to 2σ based on the assumption that samples have normal or near-normal distribution. For our samples, ωm ,n(ε) is computed, by equation (1), for

SO2, NO2, and O3 are found to take values in the ranges of [207.36-266.12], [140.72-176.42], and [191.43 -224.35]. These values are extremely greater than 1.96, which reveal the sharp nonlinearity in data.

Our methodology consists of the following steps:

1. Data Preprocessing: Data received from the sensors will be subjected to preprocessing to remove outliers and anomalies and the data will be prepared in the format acceptable by the ML learning algorithm.

2. Feature Engineering: This step is concerned with selecting the features to be included in the prediction process along with each target gas, such as temperature, humidity, and day of the week.

3. Time Windowing: This is a fundamental task with time series forecasting, in which a number of time-lagged features for each input attribute is generated in order clarify the time dependency between consecutive data points. Window size, step size and horizon are key parameters that control time windowing. Window size is the number of generated features (i.e., generating multi-dimensional vectors) from the single-dimensional data. Step size is the number of instances between windows Horizon is the number of steps in the future to before casted.

4. Building Forecasting Models: Models will be designed to predict future values based on historical data using ML algorithm.

The process encompassing the above steps to construct and apply ML-based models for predicting values of unseen target data is depicted in Figure 1.

In training, data with known target values are collected; a subset of feature is selected, and then used to construct a forecasting model. There are many subsets of features selected and various ML algorithms used; therefore, there are various predictors that can be trained.

In testing, the produced models from the training phase are validated and evaluated. Several methods are used in model validation, such as different sliding windows, in which two windows are used for training and testing and each has its own size, step size, and horizon. This validation method guarantees that instances used for testing are not known before to the model through training, hence reliable performance measures are calculated such as prediction trend accuracy (PTA) and root mean square error (RMSE). PTA is a time series measurement of how close is the predicted data trend from the trend of the actual data

First, actual trend (AT) and predicted trend (PT) are calculated as:

AT = Label [i] – Label [i – horizon]

PT = Predicted [i] – Label [i – horizon]

Where Label is the target feature, i is the instance number, and horizon is the number of steps forecasted in the future.

Trends are then multiplied by each other. If the result is greater than or equal to zero, then the actual and predicted trends have the same sign, hence have the same trend, so a counter is incremented. This process is repeated for all data, and finally, the counter is divided by the total number of instances. RMSE is a common performance metric in model evaluation and it is calculated as:

$$RMSE = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y - \hat{y})^2)}$$

where n is the number of instances, y is the actual value of the target feature and $\hat{y}$ is the predicted value of it.

Normalized RMSE (NRMSE) is used to compare the performance of different models predicting different target variables and it is calculated as:

$$NRMSE = \frac{RMSE}{(y_{max} - y_{min})}$$

Where ymax and ymin are the maximum and minimum values of collected data.

In the deployment phase, the best model and features will be used to process unseen data and produce prediction results. The model performance is kept on check to validate its prediction results.

Practically, and especially in changing environments, the process of training, testing, and deployment are periodically repeated to maintain high accuracy of results. Moreover, this iterative process can be performed to improve performance of the models as historical data become increasingly available. There exists a plethora of algorithms to build ML-based forecasting models that may behave differently to the given data [2].
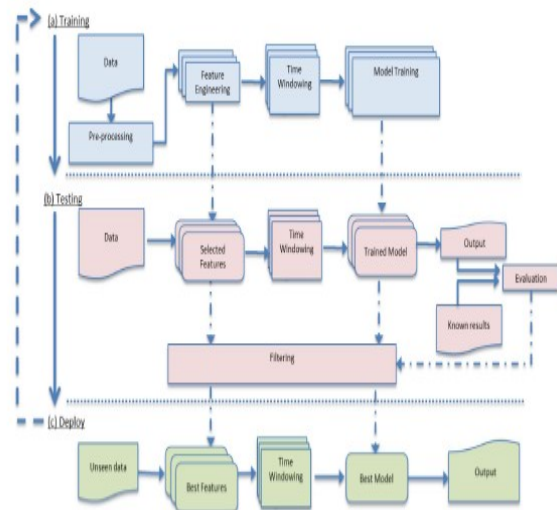

Fig. 1. Iterative process of constructing and applying ML-based prediction models.

V. APPLICATION AND FUTURE SCOPE

It is significantly useful for alarming applications in areas with high air pollution levels and the used regression model to predict air pollution concentration for health exposure studies. In future it is advantageous because it will identify pollution sources and predicting urban air quality using MLA methods. Its low cost sensors in conjunction wireless sensor network creates an opportunity to collect real time data from different location and provide detailed pollution map.

VI. CONCLUSION

Air pollution is the major problem of today's society that affects both the environment and human health. In this paper we focus on monitoring system and forecasting model for the daily forecast of pollutant concentration. This paper has proposed a new time series based on forecasting model to predict air quality by maximum O3 concentration. From the air quality pollutes main is caused by O3.future search can test whether the air quality have influenced the nearby human health and the security under high-tech operation. These models predict 1, 8, 12, and 24 hours ahead of concentration values.

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A Survey on Sinusoidal PWM Technique for VSI Fed To Induction Motor

Rohit Gedam[1], Varsha Mehar[2] , Sheikh Nawaz[3]

[1]Department of Electrical Engineering, Bhabha College of Engineering (RKDF), Bhopal, Madhya Pradesh, India
[2]Assistant Professor, Department of Electrical Engineering, Bhabha College of Engineering (RKDF), Bhopal, Madhya Pradesh, India
[3]Assistant Professor Anjuman college of Engg & Tech, Nagpur, Maharashtra, India

ABSTRACT

In this project, sinusoidal pulsewidth modulation (SPWM) technique for Voltage Source Inverter (VSI) to induction motor or with different load is proposed. The Voltage Source Inverters(VSI) using the proposed SPWM technique can generate output voltage & current waveform for the different load.

In the medium voltage adjustable speed drive market, the various topologies have evolved with various components, design, and reliability. The two major types of drives are known as voltage source inverter (VSI) and current source inverter (CSI). In industrial markets, the VSI design has proven to be more efficient, have higher reliability and faster dynamic response, and be capable of running motors without de-rating.

Medium voltage adjustable speed drive (MV-ASD) systems offer significant advantages in fan, pump and many process control applications with higher efficiencies combined with energy savings over a wide range of speed settings. MV-ASD systems continue to grow at a steady rate of 9% and find expanding applications. Commercial MV-ASD systems are both current source inverter (CSI) and voltage source inverter (VSI).

Voltage source inverter (VSI) is to convert a fixed dc voltage to a three phase ac voltage with variable magnitude and frequency. This project focus on pulsewidth modulation (PWM) schemes for high power two level inverter , where the device switching frequency is normally below or equal to 1KHz.

In this project, sinusoidal pulsewidth modulation (SPWM) technique for Voltage Source Inverter (VSI) to induction motor or with different load is proposed. The Voltage Source Inverters(VSI) using the proposed SPWM technique can generate output voltage & current waveform for the different load.

Keywords: Sinusoidal pulsewidth modulation (SPWM), voltage source inverter (VSI), Induction Motor, different load(L, R & C load).

I. INTRODUCTION

Due to various aspect in starting of motors in this project are studied the different load and aspects to other simulation [1] In this hybrid PMW technic

reduction of torque ripple in voltage source inverter fed induction motor drives [2]in this PWM technique for nth harmonic injection for n-phase VSIs. The simulation results are obtained for 5, 7 and 9-phase VSIs [3]in this proposed for detecting

IGBT open circuit faults. The method is an extension of the traditional three-phase average current method.[4] Random PWM with saw tooth carrier is proposed in the paper. Compared to sinusoidal PWM, the performance of saw tooth carrier based RPWM is improved in terms of fundamental voltage and Total Harmonic Distortion.[5] Traditional voltage source inverter (VSI) used to drive a three phase induction motor (IM) is a two level inverter. Various control techniques are employed to improve the DC-link utilization and to reduce the DC-link voltage. Lower DC-link voltage reduces the voltage stress across active switches and passive elements, thereby increasing the inverter reliability

II. VOLTAGE SOURCE INVERTER

The VSI that transforms the input dc lick voltage into the three phase balanced ac output voltages required by the load. the use of voltage source type inverters with (PWM) of the line voltages for improved performance. In addition to these advantages, the voltage source approach offers improved system reliability and capability of sustained regeneration. The main downside of VSI lies in its narrow dynamic concert. The effect varies with changes in working conditions and system parameters, causing the design of a wide-bandwidth controller with fast dynamic response to be difficult.

An idealized PWM VSI is in Figure 2.1. the converter is cucumed of six IGBT switches. The inverter produces a defined PWM output voltage. On the DC side of the converter is an ideal dc voltage source Vd. The voltage source inverter normally required a 3^ϕ capacitor at its output to help the commutation of the switching devices. The capacitor provides a current track for the energy

hugged in, it also work as a harmonics filter, advanced the load current and voltage sinusoidal form. The new IGBT VSI with sinusoidal PWM control techniques is put ahead, for the purpose of supplying both the alternating turnout voltage and current to the motor. The resonance current is reduced by the addition of PWM control.
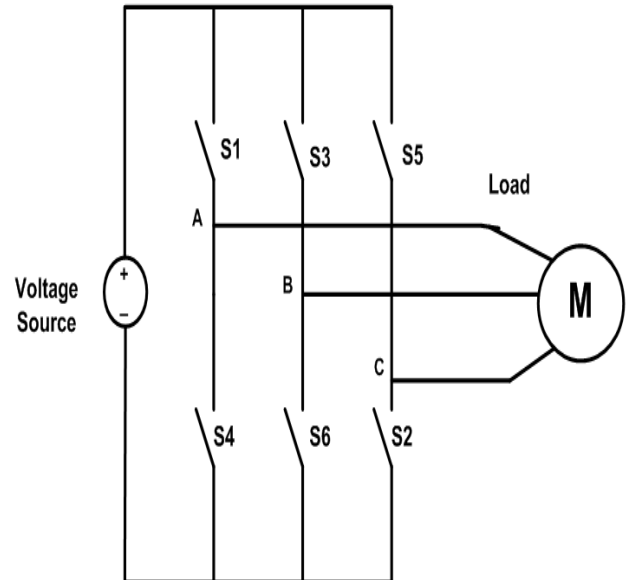
Figure 1. PWM Voltage Source Inverter

Above inverter comprises a constant dc power supply, an inverter section to convert the dc power to the variable voltage variable frequency ac power and an induction motor at the load side. Moreover, three capacitors are connected to the ac output terminals to absorb the over voltages which occur when the current is cutoff.

2.2. COMPARISION BETWEEN VSI & CSI

The following Table 2.1 shows the comparison between VSI & CSI

VSI	CSI

(1) Input voltage is maintained constant & input current may or may not be constant. (2) The amplitude of output voltage does not depend on the load. However, he amplitude and waveform of output current depends upon the load. (3) The misfiring of switching devices may cause short circuit across the source and create serious problem. (4) VSI create serious problem against a short circuit across motor terminals. (5) VSI is less reliable.	(1) Input current is maintained constant& input voltage may change with load. (2) The amplitude of output current is independent of load. However, the amplitude and waveform of output voltage depends upon load. (3) Input current is maintained constant, misfiring switching devices or short circuit across source would not be a serious problem (4) CSI gives inherent protection against a short circuit across motor terminals. (5) CSI is more reliable than VSI.

2.3. VOLTAGE CONTROL IN INVERTERS

The voltage control in the inverter is essential due to the following reasons;

(1) In VSI, the output AC voltage depends upon the input voltage.

(2) Voltage control is essential, to compensates the variation in input dc voltage, so as to provides fixed ac output voltage.

(3) Voltage control is essential, for voltage regulation of the inverter under the various loading condition.

(4) If, the inverter supplies induction motor, the voltage to frequency ratio must be maintained constant at the motor terminal, therefore the voltage control is essential.

The control over the O/P voltage of the converter can be acquired by following two ways:

(i) External Control

    (a) Outward controlling the AC O/P voltage

    (b) Outward controlling the DC I/P PD

(ii) Intramural Control

2.3.1 OUTWARD CONTROLLING THE AC O/P VOLTAGE

In this technique, an alternating current voltage controller is used between inverter and load, as in figure 2. An inverter is supplied with constant dc voltage, output ac voltage of the converter is fed to ac controller and output voltage of ac controller, which is a controlled ac voltage is fed to load.
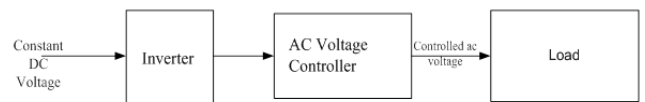
Figure 2. Externally Controlling Ac Output Voltage Of Inverter.

In ac controller, by phase angle control, the voltage is controlled. When output voltage required to be low, this control gives rise to higher harmonics content in output voltage, hence this method is rarely employed in high power application . However, this method is accepted in low power application.

2.3.2 EXTERNALLY CONTROLLING THE DC INPUT VOLTAGE

For Acquiring control over output potential difference of inverter, the input dc voltage of inverter is steer by following methods, as in figure 2.

(1) Obtaining controlled dc supply for inverter from fully controlled rectifier and filter (Figure 2.a)

(2) Obtaining steer dc supply for converter from uncontrolled rectifier, chopper and filter. (Figure 2.b)

(3) Obtaining controlled dc supply for inverter from AC voltage controller, uncontrolled rectifier and filter.(Figure 2.c)

(4) Obtaining controlled dc supply for inverter from chopper and filter. (Figure 2.d)

Figure 2.a

Figure 2.b
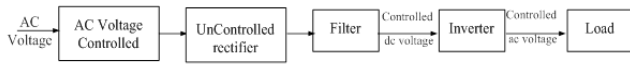
Figure 2.c

Figure 2.d

Figure 2. Externally controlling dc input voltage to inverter.

These method have an advantage that the harmonics content and output voltage waveform are not affected appreciably, as the output voltage is not directly controlled. It is controlled through the control over input dc voltage.

2.3.3 INTERNAL CONTROL

The O/P voltage of an inverter can be steer by the operation of inverter itself. The control is inside the inverter itself. The most methodical steer of controlling the O/P voltage is used PWM inside the inverter. In this technique, the ON & OFF periods are adjusted to control the output voltage.

2.4 CHARACTERISTICS OF A PWM VOLTAGE SOURCE INVERTER

Simple Converter Topology: The IGBT devices used in the inverter are of symmetrical type, which do not require anti-parallel freewheeling diodes.

Motor Friendly Waveforms: The voltage source inverter produces a three phase PWM voltage instead of PWM current as in CSI. With the filter capacitor installed at the inverter output , the load current & voltage waveform are close to sinusoidal. The high dv/dt problem associated with the VSI does not exist in CSI.

Reliable Short-Circuit Protection: In case of a short circuit at the inverter output terminals, the rate of rise of the dc voltage is limited by the dc choke, allowing sufficient time for the protection circuit to function.

III. PULSEWIDTH-MODULATION TECHNIQUES

The available PWM techniques can be categorized into two kinds: one is an on-line generation technique and the other is an off-line generation technique. The pre-calculated off-line PWM switching patterns are usually optimized to eliminate a certain order of harmonics. But, the trade off is slow dynamic response and imprecise control of the ac line current.

For the online generated PWM switching patterns, two types can be realized: the carrier-based PWM and space vector (SV)-based PWM. The carrier-based Pulse Width Modu is produce by comparison of triangle carrier wave and sine modulating wave. This method is easy to apply by analog circuitry. The SV-based PWM utilizes the space vector concept, and it can easily be apply by a microprocessor or a digital signal processor.

In most applications, "carrier-based PWM technique" is used to steer the inverter switches due to its low-harmonic distortion characteristics and constant switching frequency. This technique employs "the per-carrier cycle volt-second balance principle" to generate a desired inverter output voltage. As the principle, in a PWM period, the Avg value of the O/P rectangular voltage pulses is same to the desirable voltage value . Sinusoidal PWM (SPWM), which is the simplest PWM method, has been used for many decades. However, in 3ϕ, 3-wire inverter applications such as AC motor drives, the inverter staging can be significantly improved by modification of the SPWM pulse pattern.

While this enlarge switching frequency reduces harmonics, emerge in a lower THD by which high excellent O/P voltage waveforms of desired fundamental r.m.s value and frequency which are as close as possible to sinusoidal wave. There are divers PWM methods proffer in the belles-letters which differ in idiom of their voltage linearity range, DC bus and AC output current ripple, switching losses, high frequency CMV.

3.1 DIFFERENT PWM TECHNIQUES

- ✓ Single Pulse-Width-Modulation.
- ✓ Multiple Pulse-Width-Modulation.
- ✓ Sinusoidal Pulse-Width-Modulation.
- ✓ Space Vector Pulse-Width-Modulation.
- ✓ Phase-displacement control.
- ✓ Ramp Type Pulse-Width-Modulation.
- ✓ Trapezoidal Pulse-Width-Modulation.
- ✓ Selective Harmonics Elimination Pulse-Width-Modulation.
- ✓ Random Pulse-Width-Modulation.

IV. SINUSOIDAL PWM TECHNIQUES

4.1. Sinusoidal PWM Concept

The sinusoidal SPWM technique generate a sinusoidal waveform by riddle an O/P pulse waveform with alter width. A high redirect frequency leads to a better riddle sinusoidal O/P waveform. The covet O/P voltage is achieved by alter the frequency and peak of a aludance or modulating voltage. The changes in the peak and frequency of the ref voltage change the PW patterns of the O/P voltage but keep the sinusoidal modulat.

As shown in Figure 3, a low-frequency sinusoidal transmogrify oviform is corelated with a high-frequency triangular oviform, which is called the carrier oviform. The switching state is retoted when the sine oviform intercross the triangular oviform. The crossing tract determine the iffy switching times between states.
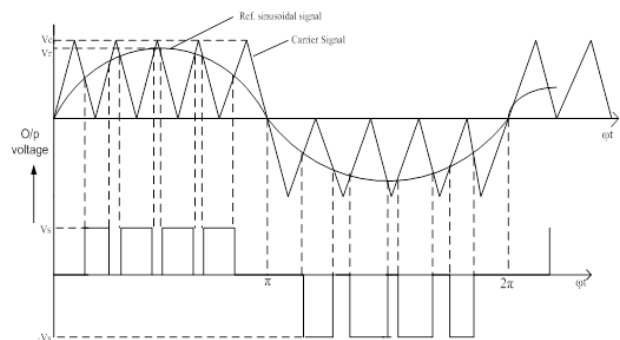
Figure 3. Sinusoidal Pulse-Width Modulation (Spwm).

Figure 5.1.shows reference sinusoidal modulating wave V_r and the triangular carrier wave V_c. The fundamental frequency inherent in the inverter O/P voltage can be steer by Amplitude modulation index, m_a.

$$m_a = \frac{V_r}{V_c}$$

The amplitude modulation index m_a is usually adjusted by varying Vc while keeping Vr fixed. The frequency modulation index is defined by m_f,

$$m_f = \frac{f_c}{f_r}$$

Where f_c and f_r are the frequencies of carrier & reference waves.

The operation of switching is determined by comparing the reference modulating waves with the carrier wave . when $Vr \geq Vc$ the upper switch in inverter leg is turned on. The lower switch operates in a complementary way and thus is switch off. When $Vr < Vc$, lower switch is off, Since the waveform has only two level, the inverter familiar as a 2-level inverter. It should be recognized that to elude possible S.C during veer transient of the upper and lower devices in an inverter leg, a blanking time should be put in effect, during which both veer are turned off.

The magnitude and frequency of can be independently steer by m_a and f_r respectively. The converting frequency of the active veer in the two level converter can be found from,

$$f_{sw} = f_c = f_r \times m_f$$

4.1.1 HARMONIC ANALYSIS

With the help of Sine PWM scheme the harmonic analysis of the following observation can made:

The distortion aspects is significantly decrees compared to that of diverse pulse modulation.

All harmonics less than or equal to 2p-1 are eliminated.

For modulation index M<1, the imperious harmonics are of the order of 2p±1.

For modulation index M>1, since pulse-width is formerly a sinusoidal role of the angular locus of pulse, the lower order harmonic appear.

Higher no. of pulses per 1/2 cycle p, minimizes the filtering requirement, but result in high switching frequency, high switching losses and low inverter efficiency.

4.2 STUDY & SIMULATION OF SPWM VOLTAGE SOURCE INVERTER

The given fig shows Voltage Source Inverter with sinusoidal PWM Techniques. The O/P Voltage of an inverter can be steer by controlling the activity of inverter itself. The most valuable method of steer the O/P voltage is use PWM technique within the inverter.
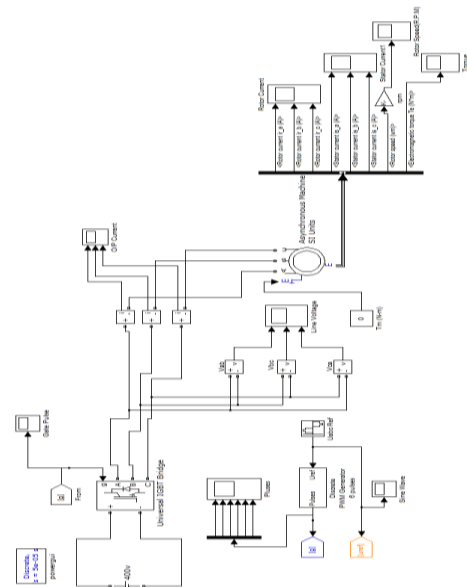
Figure 4. Simulated Model Of VoltageSource Inverter Fed To A Induction Motor With SPWM.

In a given simulated model, the main system block is the VSI that transforms the input dc lick voltage into the three phase balanced ac output voltage appropriate by the motor load. To improve the attainment characteristics of the VSI, the traditional six-step voltage control method has been replaced with the optimum PWM method with sinusoidal pulse width modulation, asshown in Figure 5.2. The resulting VSI structure yields input

dc lick voltage and output voltage & current waveforms which do not contain low order harmonics. These features, in turn, result in proportional size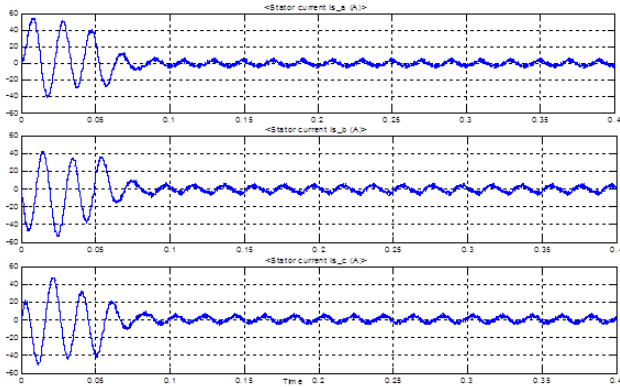 reductions for the inverter I/P and O/P filters. Moreover, since the inverter line currents contain only high-frequency harmonic components which are subsequently filtered (i.e bypassed) the voltage accentuation on the inverter components have been minimized.

The proposed PWM VSI supplies variable amplitude variable frequency sinusoidal voltage and contributes to the absence of harmonic copper/core losses, torque pulsations, acoustic noise associated with typical PWM voltage fed machines.

Figure 5. Simulated Stator Current Of A SPWM VSI Fed To A Induction Motor.

Figure 6. Simulate Rotor Current Of A SPWM VSI Fed To A Induction Motor.

Figure 7. Simulation Speed& Torque Characteristics Of SPWM VSI Fed To Induction Motor Load
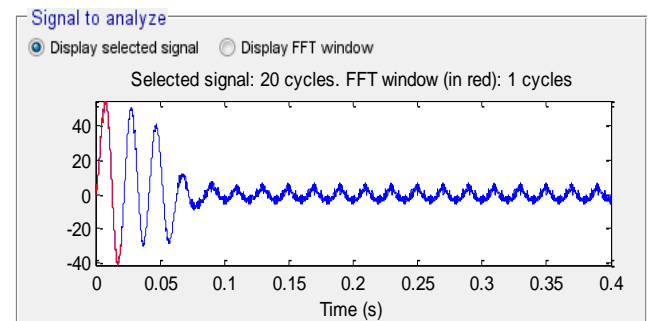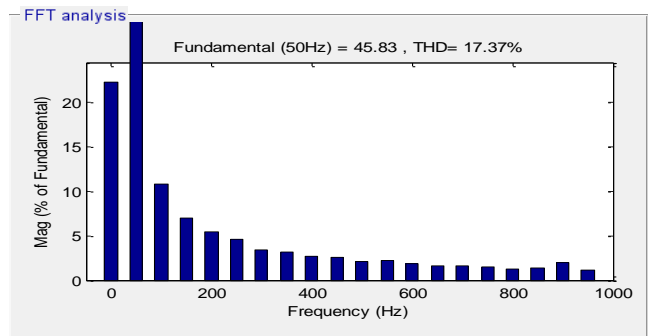
Figure 8. FFT Analysis Of A SPWM Voltage Source Inverter

V. CONCLUSION

- ✓ Short-circuit protection, the output voltage being bound by the governed dc-bus current.
- ✓ Low output voltage , resulting from the filtering effect of the output capacitor.

✓ High converter constancy, due to the unidirectional traits of the swap and the inherent short-circuit protection.

✓ Utilization the SPWM technique, which has fast dynamic respond and stability.

✓ The proposed steer scheme analyz the calculation process of the Sinusoidal PWM, which cause it possible to be put into effect in low cost processors.

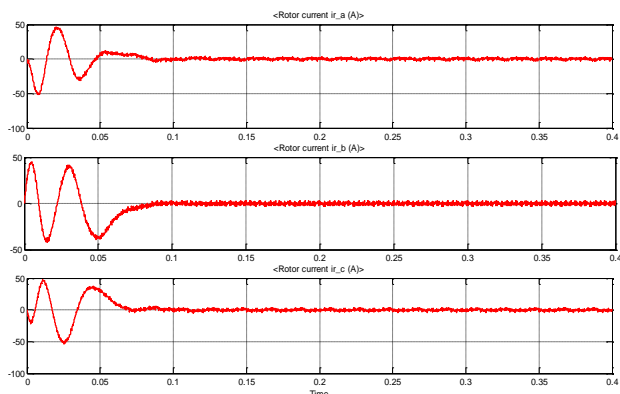✓ The collecting signals are directly generated by the Sinusoidal PWM.

✓ The stresses on power swap and the overall losses are always reduced.

✓ Due to the firm inverter modulation index service, the motor voltage harmonic distortion is firm, which reduces the induction motor losses.

✓ These features make the VSI drive an interesting alternative to VSI-based drives operating at similar switching frequency, when the requested fundamental reactive power could be disregarded with respect to output power.

✓ The PWM -VSI has simple converter topology, motor friendly waveform, & reliable short-circuit protection.

These features make the VSI drive an alluring alternative to VSI-based drives performing at similar swap frequency, when the requested basic reactive power could be disregarded with respect to O/P power.

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Investigation of Sst Pwm in qZSI

S. G. Kadwane, Nitesh Funde, Shivani Patel, Priyanka Kale, Aishwarya Meshram
Electrical Department, YCCE, Nagpur, Maharashtra, India

ABSTRACT

This paper presents an analysis of single phase Quasi Z-Source (qZS) Inverter based grid connected system. Quasi Z-Source DC to DC converter consists of unique impedance network which consists of inductors and capacitors. To boost DC voltage, traditional boost converters were used. But it has many disadvantages like dual stage converter, complexity in control, losses are high. On the other side the quasi-Z-Source Inverter (qZSI) is an alternative converter that can boost the input voltage. It has many advantages like single stage conversion, lesser losses, reduced component rating as well as size of components and provides continuous input current. Quasi-ZSI provides boost capability with single stage conversion which ultimately reduces the switching losses. qZSI allow the shoot through state which is responsible for the boosting of the input voltage to the higher values and avoids the risk of damaging switches in converter circuit to make the circuit more reliable. Theoretical analysis of boosted voltage and control methods for the qZSI system are investigated in this paper. Both simulations and theoretical analysis will be presented to demonstrate the proposed concept.

Keywords: Quasi-Z-Source Inverter (qZSI), DC to DC converter, shoot through state, PWM

I. INTRODUCTION

With the increasing use of renewable source of energy, the fossil fuels are on edge of its extinction. Because of which the concern about the non-renewable energy sources, constant increase in fossil fuel prices, global warming damage to environment and ecosystem, and the renewable energy is becoming more popular and is gaining more attention as an alternative to non-renewable energy sources [2]. Among the renewable energy sources, the photovoltaic energy is considered to be the most promising energy resource as compared to other types of energy sources such as wind, tidal etc. The output obtained by the PV system is unregulated DC which is of small capacity power source at the customer site at distribution voltage levels. Therefore, DC converters are used for boosting up of unregulated DC voltage obtained by the PV module to a regulated suitably higher voltage levels to supply power to the load [3]. Conventional PWM inverters are of buck type inverters and require additional power stage to boost the voltage from the renewable source. Hence, complexity in control, losses are high, stresses on the switch increases which makes the system less efficient [4]. Therefore, there is a need to develop buck- boost type inverters for renewable energy based DG system. For applications requiring both buck and boost power conversions, z- source inverters based topology has been proposed earlier. But the control complexity is an issue when the ZSI is used in a back-to- back configuration due to the coupling of the inverter switching functions. Also

the total harmonic distortion obtained is high [8]. Therefore, the advanced topology, quasi-z source based grid connected system is to be investigated over conventional methodologies.

In case of ZSI impedance source network, the sine PWM (SPWM) pattern, which is symmetrical by its nature, the symmetry is not preserved due to the addition of a shoot- through state, which generates lower order harmonics [5]. In this paper, the concept of Symmetrical Shoot-Through based PWM, in which sinusoidal shoot-through state is additionally inserted so as to preserve the sinusoidal nature of the SPWM which further reduces the THD, of the voltage waveform generated at the output [9]. Decoupled control ensures nearly independent control of the DC side controller and AC side controller. The DC side controller is used to track the maximum power point in Photovoltaic generation. The AC side controller is used to regulate and fed the necessary power to the grid. In this paper, using a symmetrical shoot through based PWM the Quasi Z-source based grid tied inverter is investigated [8].

II. PROPOSED QUASI-Z-SOURCE BASED CONVERTER BASED GRID TIED INVERTER SYSTEM

The given proposed scheme is qZS converter which is shown in Figure 1. It is similar to the VSI; the only difference is it consists of qZS impedance network connected after the DC source. The impedance network is the combination of capacitors (C_1, C_2), inductors (L_1, L_2) and diode D.

Unlike the traditional voltage source or current source inverter, the qZ-Source inverter has a unique impedance network. This LC impedance network is coupled with an inverter which boosts

output capability of the qZSI. The single phase qZSI consists of five switching states given as follows:
1. Two active
2. Two zero and
3. One shoot through state.

Out of these, the shoot through is the unique state which is responsible for the buck-boost capability of qZSI.

The shoot-through zero state is not applicable in the traditional V-source inverter, because it would cause a short- circuit or damage the system. With the help of LC network, the qZ-Source Inverter is capable to use the shoot through state to boost the voltage. In addition, with the ability to handle the shoot through state, the inverter system becomes more reliable.

The impedance LC network helps the inverter from damage during the shoot-through state

or any fault occurs. During shoot-though state the input voltage gets boosted to the higher values and it is controlled through the shoot through signal.

During non-shoot through state, the inverter operates normally as a traditional voltage source inverter (VSI). Where the two opposite switches of an inverter operates simultaneously. Total time period (T) will be the sum of both shoot through state time (T_1) and non-shoot through state time (T_2). Shoot-through duty ratio D can be given as D = T_1 T . For qZS network, let assuming identical values of inductances L_1, L_2 and identical values of capacitances C1 and C2.
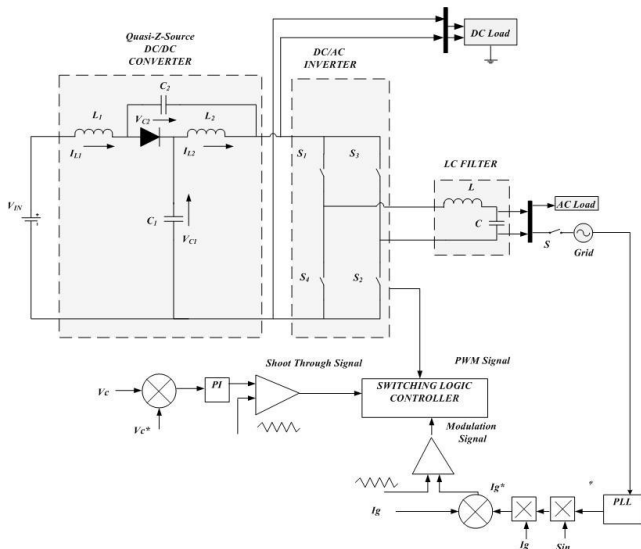
Figure 1. Block Diagram of AC and DC Hybrid System Using qZSI

As the input DC voltage is not constant in nature, the DC side control loop consists compared with a reference value, and this error quantity is given to the PI controller, which eventually, generates the modulation signal for inserting the shoot-through in, the zero states. Thus, the DC link voltage is controlled effectively, by modulation of the shoot-through duty ratio. The AC side control loop involves the control of AC side voltage with reference generation for generating the modulating signal. This control employs a comparison of the output voltage with, a reference voltage, and this compared output is given to a PI controller which will generate the modulating signal and with the help this modulating signals, we can generate the PWM signals. of a DC link voltage in order to maintain a constant voltage across the inverter. The qZ-source capacitor voltage which is input to the inverter needs to be regulated in order to regulate the DC link voltage. The variations in load voltage is happened because there is variations in DC link voltage, these variations in the DC link voltage will occur due to change in input DC voltage. Thus, the DC link voltage must be regulated. For this, the qZ-

source capacitor voltage is taken as the controlling quantity. This voltage is Figure 4: Waveform of SST The logic diagram for the generation of a modulating signal pulses is shown in Figure 4. The shift h in a carrier wave is given by DC side controller and the modulating signal M is given by the AC side controller. The two carrier signal is in upward direction and downward direction which is shifted by h/2 value using the summing amplifier. Upward shifted carrier is compared with modulating signal to produce a PWM signal of first leg upper switching device S1 and the complement of this signal provide the PWM signal of second leg upper switching device S3 . Similarly, downward shifted carrier waveform is compared with a M (modulating signal) to produce PWM signals of lower switching devices S2 and S4 . Hence necessary shoot-through states are produced by using this shifted carrier approach logically.
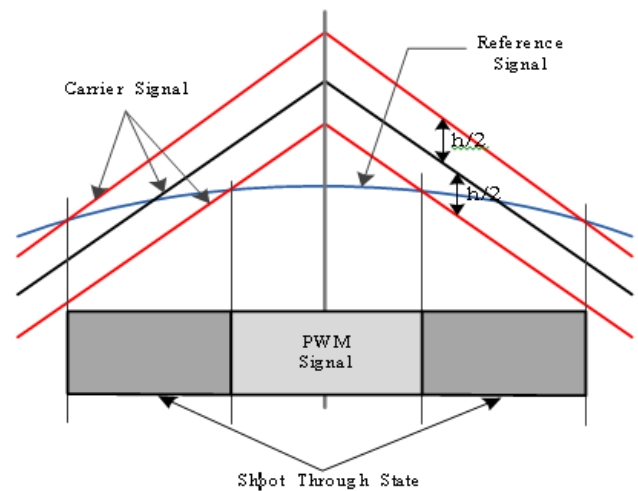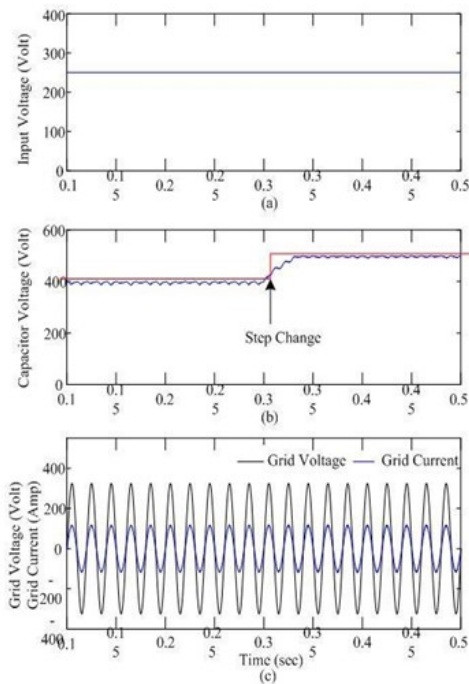

Figure 2

III. Simulation results
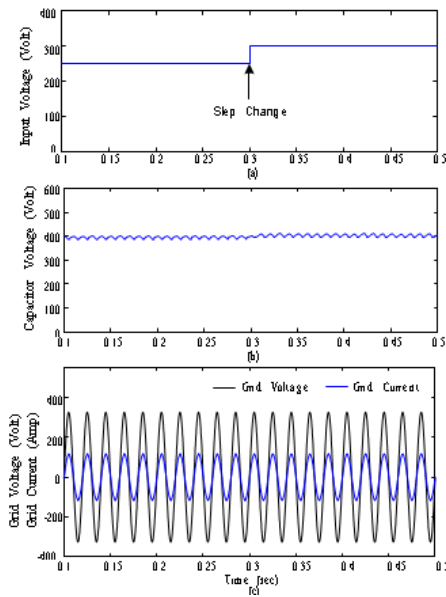
Figure 3. Simulation result for step change in voltage from 250V to 200V (a) Input voltage (b) Capacitor voltage (c) Grid voltage and current (scaled by x 10)

Figure 4. Simulation result for step change in capacitor voltage from 400V to 500V (a) Input voltage (b) Capacitor voltage (c) Grid voltage and current (scaled by x 10).
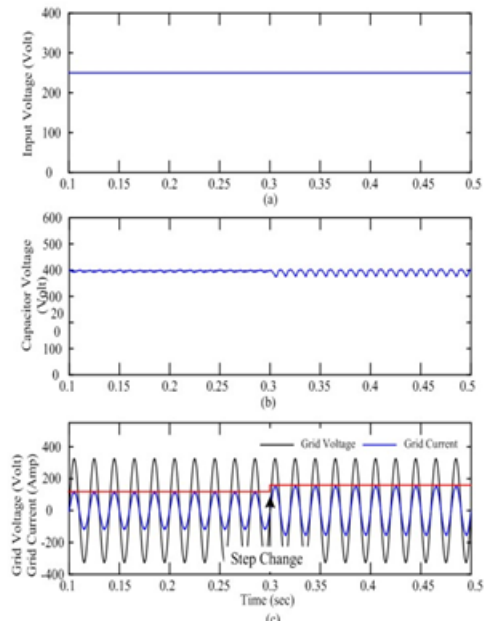
Figure 5. Simulation result for step change in current from 5A to 10A (a) Input voltage (b) Capacitor voltage (c) Grid voltage and current

IV. Conclusion and Future scope

A symmetrical shoot through based PWM method for a Quasi-Z-Source Inverter has been investigated experimentally and presented in this paper. From simulation results it is found that by inserting a symmetrical shoot through state using PWM the total harmonic distortion has been reduced as compared to the existing PWM methods. This paper also demonstrates, a simple carrier shifting method for the implementation of this symmetrical shoot through PWM. The Quasi-z source based inverter topology presented in this paper provides several advantages when compared to the traditional ZSI. These advantages include reduction of passive component ratings, reduced component count, and improved input efficiency of the system. Both, the simulation and experimental results are compared and analyzed which confirm the theoretical analysis. The dynamic response of the DC as well as AC side controllers with the proposed

PWM is validated over different operating conditions.

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Review of Impedance Source Dc-Dc Converters

Nitesh Funde, Mohini Sonparote, Dipali Pimpalkar, Mayuri Thakare
Department of Electrical engineering, YCCE, Nagpur, Maharashtra, India

ABSTRACT

Now-a-days due to the requirement of renewable energy sources, distributed generations (DG) are widely used. In such applications, DG grid connection is required through DC-ac inverters. But the DC output from fuel-cell is in low quantity, therefore there must needed the network which boosted up the DC voltage to the required level. To fulfill this requirement, Impedance Source DC to DC converter is required. Impedance Source-Converter is an advanced technology in electrical energy conversion, overcome limitations of traditional converters. This paper presents different types of impedance source networks for DC to DC power conversion. All types of impedance networks adapt a unique impedance network to connect a converter main circuit to source from which the supply is taken. Thus, providing the features that cannot available in the traditional voltage-source and current-source converters in which capacitor and inductor are used, respectively. The impedance source converter overcomes all the problems, barriers and limitations of the traditional converters and provides a new power conversion concept. These impedance source networks can be used in all DC-DC, ac-DC, ac-ac, DC-ac power conversion. So this paper describes the operating principle, simulation results and sizing of components of three types of impedance network and its comparison.
Keywords: Fuel cell, DC-DC converter, Impedance source converter, Quasi Z-source converter, Quadratic converter

I. INTRODUCTION

Now-a-days due to the requirement of renewable energy sources, distributed generations (DG) are widely used. In such applications, DG grid connection is required through DC-ac inverters. But the DC output from fuel- cell and Photo Voltaic panel is so small as compared to grid voltage. Therefore, there must need of the network which boosts up the DC voltage to the required level. To fulfil this requirement DC-DC converter has been connected in between DG and inverter. In conventional method boost, buck-boost converters

are used. But, due to their disadvantages all the researchers working on the Impedance Source DC to DC converters [1-2].

There is two traditional converters viz., current source converter and voltage source converter. In voltage source converter, a DC voltage is supplied by a relatively large capacitor which feeds the main converter circuit. The DC source may be a battery, fuel-cell stack, diode rectifier and it may be a capacitor [3-4]. This voltage source is widely used but it has conceptual barriers and disadvantages are as follows [5]-

The ac output voltage is limited and it cannot exceed the DC-rail voltage or DC-rail voltage has to be greater than ac input voltage. Hence, voltage source converter is a buck inverter for DC to ac conversion and the voltage source inverter is a boost converter for ac to DC conversion.

For such application where only one drive is desirable but the availability of DC voltage is limited, in that case an additional DC to DC boost converter is required to obtain a desired output voltage. This additional converter increases system cost and reduces efficiency.

Sometime, shoot-through may occur due to Electromagnetic Interference, it causes the destroying devices and reliability reduces.

In current source inverter, a DC current source feeds the main converter circuit. The current source may be a large inductor supplied by voltage source such as a battery, fuel-cell, diode rectifier, or it may be a thyristor converter. The current source has following disadvantages [5]-

The ac output voltage is greater than the original DC input voltage which feeds the DC inductor or the DC output is smaller than the input ac voltage. Hence, the current source converter for DC to ac conversion and the current source converter is a buck converter for ac to DC conversion.

For application where variable voltage range is required, an extra DC to DC buck or DC to DC boost converter is essential. This additional converter increases system cost and reduces efficiency.

Sometime, shoot-through may occur due to Electromagnetic Interference, it causes the destroying devices and reliability reduces.

Both current and voltage source converters having following common problem [5].
Their output voltage range is limited to either greater or smaller than the input voltage. That is, they are either a boost or a buck converter and they cannot be buck-boost converter simultaneously.
Both the circuits cannot be exchange with each other. That is, voltage source converter cannot be used as a current source converter or cannot be vice versa.
In both the circuits, due to EMI shoot-through occurs and reduces reliability.

Therefore, to overcome all these disadvantages and limitations, the impedance source network is used. There are three impedance networks as follows [6]-

- Z-source converter
- Quasi Z-source converter
- Quadratic Z-source converter

They all having the advantages like higher efficiency, reduces voltage stress, avoid the damaging to the circuit due to EMI etc.

In this paper there are five sections. Second, third and fourth section represents the review and mathematical modeling of ZSC, QZSC and Quadratic converter respectively. Fifth section signifies the component size and comparison between all impedance converters.

II. REVIEW OF Z-SOURCE CONVERTER

In Figure 1 shows proposed structure of simple Z-source converter. It familiarizes a unique impedance converters

network to connect the converter main circuit to the DC source. Load or another DC-AC converter can be connected after Z-source converter, for providing the exclusive features which is not available in traditional voltage source and current source converters in which capacitors and inductors are used, respectively. The Z-source converter overcomes these disadvantages [7]. In the two port network of Z-source converter consists of two capacitors C1 and C2, two inductors L1 and L2 and they are all connected in X shape to provide an impedance source. The voltage source or current source can be used as a DC source. Therefore, DC source can be a fuel-cell stack, an inductor, a capacitor, diode rectifier or a thyristor converter. The inductors used may be split inductors or two separate inductors. In this, same ratings of inductors are used and same ratings of capacitors are used [7].

This Z-source converter can be used for all DC to ac, ac to DC, ac to ac and DC to DC conversion. Example of z- source converter is a Z-source inverter used for DC to ac conversion for fuel-cell applications. Fuel-cell is widely used for fuel-cell vehicles and distributed power generation. Fuel-cell normally produces a voltage (2:1 ratio) depending on current taken from the stacks. Therefore, a boost DC to DC converter is needed because the traditional voltage source inverter cannot produce DC voltage greater than the DC input voltage. The diode is used in series with the fuel-cell before the Z-source network for preventing the reverse current flow. The main feature of the Z-source converter is that output voltage may be any value between zero to infinity inattentive of the fuel-cell voltage. It means that, the Z- source converter is a buck-boost converter that has a wide range of obtainable output voltage. This feature is not available in

traditional voltage and current source converters [8].

The Z-source converter operates in two switching states i.e. shoot-through state and non-shoot-through state. The Figure 2 shows equivalent circuit of the Z-source converter in shoot-through state and Figure 3 shows equivalent circuit of Z-source converter in non-shoot-through state. In non-shoot-through state, the output switch is open and diode which is connected at the input side is in forward biased, i.e. it is in on state [9-10]. And in shoot-through state, diode is in off state and the switch which is connected at the output side is closed.
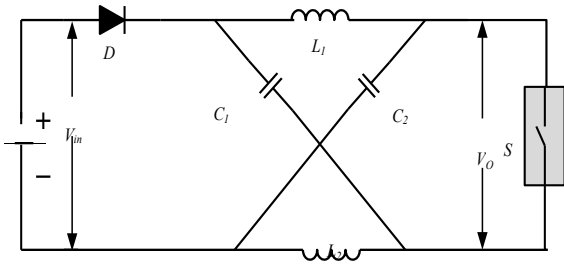
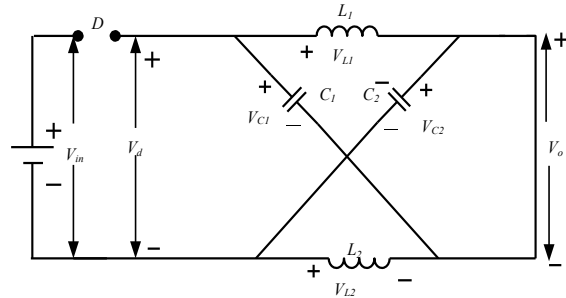Figure 1: Equivalent circuit of Z-source converter

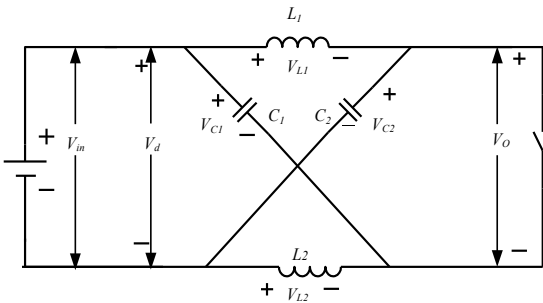Figure 2: Equivalent circuit of shoot-through state of Z-source converter

Figure 3: Equivalent circuit of non-shoot-through state of Z-source converter

From the equivalent circuits,

$$V_{c1} = V_{c2} = V_c \qquad (1)$$
$$V_{L1} = V_{L2} = V_L \qquad (2)$$

Non-shoot-through state occurs for an interval T_{OFF} during the switching cycle T.

From Fig.3,

$$V_d = V_{in} \qquad (3)$$
$$V_L = V_{in} - V_C \qquad (4)$$
$$V_0 = V_c - V_L = 2V_C - V_{in} \qquad (5)$$

Shoot-through state occurs for an interval of $T_{ON,}$ during the switching cycle T.

From Fig.2

$$V_0 = 0 \qquad (6)$$
$$V_L = V_C \qquad (7)$$
$$V_d = 2V_C \qquad (8)$$

Here, $V_O = V_{DC}$ source voltage and $T_{ON}+T_{OFF}=T$
In steady state, the average value of the inductors over one switching period (T) should be zero [11].
Thus, we get

$$V_L = \frac{T_{ON}.V_C - T_{OFF}.(V_{in} - V_C)}{T} = 0 \qquad (9)$$

$$\frac{V_C}{V_{in}} = \frac{T_{OFF}}{T_{OFF} - T_{ON}} \qquad (10)$$

$$V_i = T_{ON}.0 - T_{OFF}(2V_C - V_{in}) = T \qquad (11)$$

From equation (11),

$$V_C = V_{C1} = V_{C2} = \frac{1 - \frac{T_{ON}}{T}}{1 - 2\frac{T_{OFF}}{T}}.V_{in} = \frac{1 - D.V_{in}}{1 - 2D} \qquad (12)$$

$$V_C = .V_{in} \qquad (13)$$

Where, Boost Factor,

$$\frac{1 - D}{1 - 2D} \qquad (14)$$

III. REVIEW OF QUASI Z-SOURCE DC-DC CONVERTER

The Fig. 4 shows the equivalent circuit for Quasi Z-source converter. Quasi Z-source converter adapts unique impedance network. This network consists of two identical inductances L_1 and L_2 and two identical capacitances C_1 and C_2. Like Z-source converter, QZS converter also operates in two states. With this network

shoot through state can be apply to boost the voltage [12]. It helps the network to avoid damage during shoot-through state or any other fault occurrence. Fig. 5 shows the shoot through state of Quasi Z-source converter and Fig. 6 shows the non-shoot through state of Quasi Z-source converter.

During shoot-through state, the higher value of voltage obtained at output due to boost conversion. During non-shoot through state, it will work normally as traditional voltage source converter [13]. The advantages of QZS

converter over the Z-source converter are reducing voltage stress, drawing continuous current from the supply and reduced voltage stresses on capacitors [14].

For the non-shoot-through state

$$V_{L1} = V_{in} - V_{C1} \qquad (15)$$
$$V_{L2} = -V_{c2} \qquad (16)$$
$$V_0 = V_{C1} - V_{L2} = V_{C1} + V_{C2} \qquad (17)$$

IV. REVIEW OF QUADRATIC CONVERTER

Figure 4: Equivalent circuit of Quasi Z Source Converter

Figure 5: Equivalent circuit of Shoot-through state of Quasi Z source converter

In many industrial applications switched mode DC-DC converters with high voltage conversion ratio are widely used. In traditional converters, the voltage conversion ratio is limited due to power loss of switches as well as component stresses which results in increased duty cycle and limitations on conversion ratio. The modified method to obtain the high voltage gain is quadratic converter [15-16].

The quadratic converter network consists of two identical inductors L_1 and L_2, capacitor C and two diodes D_1 and D_2 shown in Fig.7. The voltage across capacitor is equal to the output boosted voltage. Thus the voltage across capacitor is always higher than the input voltage [17-18]. There are two working states of quadratic converter as shown in Fig. 8 and Fig. 9.
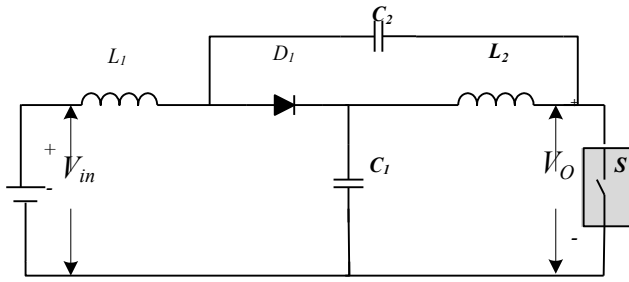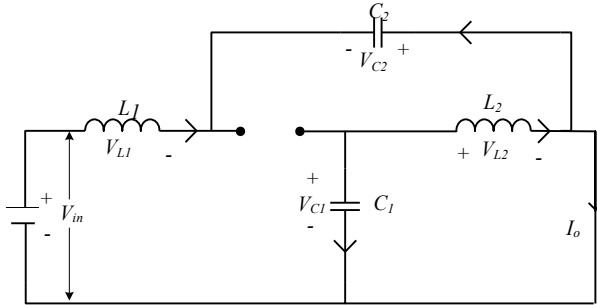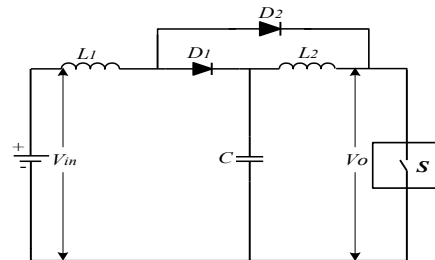

Figure 7: Equivalent circuit of Quadratic Converter

Figure 6: Equivalent circuit of Non-shoot-through state of Quasi Z source converter
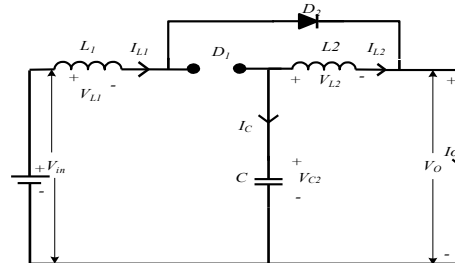
Figure 8: Equivalent circuit shoot-through-state of Quadratic Converter

For shoot-through state

$$V_{L1} \; V_{C2} \; V_{in} \qquad (18)$$
$$V_{L2} \; V_{C1} \qquad (19)$$
$$V_0 \; 0 \qquad (20)$$

At steady state, the average voltage across the both inductors over one switching cycle is zero.

$$V_{L2} \quad \frac{T_{ON} \; V_{C1} \; T_{OFF} \; V_{C2}}{T}$$
$$V_0 \; V_{C1} \; V_{C2} \qquad (21)$$

We get,

$$V_0 \frac{1}{1 \; 2D} V_{in} \qquad (22)$$
$$V_0 \; . V_{in} \qquad (23)$$

Figure 9: Equivalent circuit of non-shoot-through-state of Quadratic Converter

When switch S is ON, the diode D_2 will be ON and diode D_1 in OFF condition for duration T_{ON} of switching

$$T$$

Where, β is the boost factor and D is the Duty Cycle,

$$D \quad \frac{T_{ON}}{}$$

cycle T. At this state, capacitor of quadratic converter charges its inductors. When the switch S is

for duration T_{OFF} of switching cycle T. At this state quadratic converter inductors charge capacitor and provide voltage at output.

From Fig. 8,

$$V_{in} \quad V_{L1} \quad V_{L2} \quad V_C \qquad (24)$$

$$V_C \quad V_{L2} \qquad (25)$$

$$V_{in} \quad V_{L2} \qquad (26)$$

From Fig. 9,

$$V_{in} \quad V_{L1} \quad V_C \qquad (27)$$

$$V_C \quad V_{L2} \quad V_0 \qquad (28)$$

$$V_{L2} \quad V_C \quad V_0 \qquad (29)$$

Let, the average voltage in inductor L_1 is zero then,

$$V_{L1} \quad \frac{T_{ON} V_{in} \quad T_{OFF} \quad V_{in} \quad V_C}{T} \quad 0 \qquad (30)$$

$$\frac{V_C}{V_{in}} \quad \frac{T_{ON} \quad T_{OFF}}{T_{OFF}} \quad \frac{T}{T \quad T_{ON}} \qquad (31)$$

$$\frac{V_C}{V_{in}} \quad \frac{1}{1 \quad \frac{T_{ON}}{T}} \qquad (32)$$

$$\frac{V_C}{V_{in}} \quad \frac{1}{1 \quad D} \qquad (33)$$

Let, the average voltage in inductor L_2 is zero then,

$$V_{L2} \quad \frac{T_{ON} V_C \quad T_{OFF} V_C \quad V_0}{T} \quad 0 \qquad (34)$$

$$\frac{V_0}{V_C} \quad \frac{T_{ON} \quad T_{OFF}}{T_{OFF}} \qquad (35)$$

$$\frac{V_0}{V_C} \quad \frac{1}{1 \quad \frac{T_{ON}}{T}} \qquad (36)$$

$$\frac{V_C}{V_{in}} \quad \frac{1}{1 \quad D} \qquad (37)$$

$$\frac{V_C}{V_{in}} \quad \frac{V_0}{V_C} \quad \frac{V_0}{V_{in}} \quad \frac{1}{1 \quad D^2} \qquad (38)$$

OFF, the diode D_1 will be ON and diode D_2 is in OFF condition
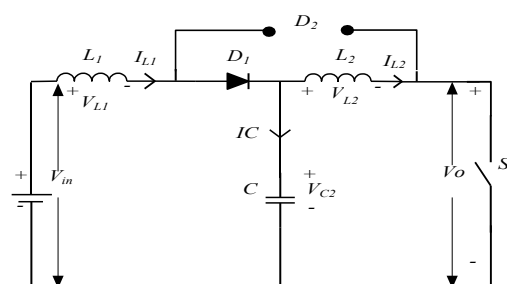
$$\beta = \text{Boost factor} \quad \frac{1}{1 \quad D^2} \qquad (39)$$

Therefore, the quadratic converter provide high voltage gain and suitable for high voltage ratio applications.

V. SIZING OF COMPONENTS

The major components of the impedance network based DC-DC converter are inductor and capacitor. For designing the converter the size of inductor and capacitor play important role and it should be as minimum as possible. At shoot through state during

boost conversion mode, inductor will limit the current

ripple I ($R_C\%$) through the devices. The maximum power P_{max} operation is chosen, the inductor value is calculate by,

$$L_1 \quad L_2 \quad L \quad \frac{V_{C1} \quad T}{I} \qquad (40)$$

$$L \quad \frac{(1 \quad D) V_{in}^2 \quad T_s D}{(1 \quad 2D) P_{max} R_C\%} \qquad (41)$$

The capacitor absorb the current ripple and limit the voltage ripple V ($R_V\%$) on the devices and so as to keep the output voltage constant can be calculated by,

$$C_1 \quad C \quad \frac{i \quad T_{L1}}{V} \qquad (42)$$

$$C \quad \frac{(1 \quad D) P_{max} T_s D}{V_{in}^2 \quad RV\%} \qquad (43)$$

The values of the passive component i.e. inductor and capacitor for impedance source converters are calculated in the Table with the following specification-

V_{in}=230V, D=0.3, P_{max}=4kW, Switching Frequency F_s=10kHz, Current Ripple R_C=25%, Voltage Ripple R_V=3%;

TABLE I

INDUCTOR AND CAPACITOR RATING FOR DIFFERENT IMPEDANCE CONVERTERS

Sr. No.	Converter Name	Inductor Size Formulae $(L_1 \ L_2 \ L)$	Capacitor Size Formulae $(C_1 \ C_2 \ C)$	Inductor and Capacitor Size
01	Z-source converter	$L \ \dfrac{(1 \ D)V_{in}^2 T_s D}{(1 \ 2D)P_{max}R \ \%}$	$C \ \dfrac{(1 \ 2D) \ P_{max} \ T_s \ D}{V_{in}^2 \ R_V \ \%}$	$L = 277\text{mH}$ $C = 30\mu\text{F}$
02	Quasi Z-source converter	$L \ \dfrac{(1 \ D)V_{in}^2 T_s D}{(1 \ 2D)P_{max} \ \%}$	$C \ \dfrac{(1 \ 2D) \ P_{max} \ T_s \ D}{V_{in}^2 \ R_V \ \%}$	$L = 277\text{mH}$ $C = 30\mu\text{F}$
03	Quadratic Converter	$L \ \dfrac{V_{in}^2 T_s D}{(1 \ D)P_{max} R_C \ \%}$	$C \ \dfrac{(1 \ D) \ P_{max} \ T_s \ D}{V_{in}^2 R_V \%}$	$L = 226\text{mH}$ $C = 53\mu\text{F}$

TABLE II

COMPARISION OF Z-SOURCE, QUASI Z-SOURCE AND QUADRATIC Z-SOURCE CONVERTER

Parameters	Z-Source converter	Quasi-Z-Source converter	Quadratic Z-Source converter
Boost factor	$\dfrac{1 \ D}{1 \ 2D}$	$\dfrac{1}{1 \ 2D}$	$\dfrac{1}{1 \ D^2}$
Input current	Discontinuous	Continuous	Continuous
Capacitor	Higher voltage stress	Less voltage stress	Very less voltage stress
Component rating	Moderate	Low	Low
Losses	Low	Comparatively low	Lower than both the converters
Voltage range	Higher than boost	Higher than Z-source	Higher than Quasi Z-source

III. CONCLUSION

In present days, Distributed Generations are widely used. For this, dc to ac inverters are required. But more power generation from dc is not possible. Therefore, there is requirement of dc to dc boost converter. Therefore, this paper has presented different types of impedance-source converters for obtaining dc to dc power conversion. All three types of impedance converter adapt unique impedance network to connect the converter main circuit to the power source. Thus it provides main feature which cannot be implemented in the traditional voltage and current source converters. Thus, all types of impedance converters overcome theoretical limitations found in voltage-source converter and current-source converter and provide an important power conversion concept. The paper described the proposed structure and operating principle of Z-source, Quasi Z-source and Quadratic Z-source converters. This paper also described the factor (boost factor) which is responsible for boosting up the voltage. Because of impedance networks the cost reduces, component minimizes and the efficiency increases. The paper also described the applications of converters like Z-source converter is most suitable for fuel-cell applications, Quasi Z-source converter is most suitable for PV power generation and Quadratic converters are used where the used of Z- source converter and Quasi-Z source converter is restricted.

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Automation of Weather Station in Agricultural Zone

Prof. Amar Banmare, Nikita Ambulkar, Dhanshree Girhe, Pratiksha Haware, Minakshi Lavale

ABSTRACT

Weather monitoring plays an important role in human life, so the collection of information about the temporal dynamics of weather changes is very important. In any industry during certain hazards it is very important to monitor weather. The fundamental aim of this paper is to develop an embedded system to design a weather monitoring system which enables the monitoring of weather parameters in an industry. Such a system contains pair of sensors like temperature, Gas and humidity will be monitored and LPC1768 microcontroller (ARM9). The data from the sensors are collected by the microcontroller and also microcontroller sends the sensors data in to the LABVIEW by using the Serial Communication and this module will keep the data in excel page & also we can get the SMS in the mobile with the help of GSM module. The system uses a compact circuitry built around LPC1768 (ARM9) microcontroller Programs are developed in Embedded C using the IDE Keiluvision4. JTAG is used for loading programs into Microcontroller.

Keywords: ATMEGA 16, Humidity sensor, Temperature Sensor, LABVIEW, GSM Module

I. INTRODUCTION

An automated weather station is an instrument that measures and records meteorological parameters using sensors without intervention of humans. The measured parameters can be stored in a built-in data logger or can be transmitted to a remote location via a communication link. If the data is stored in a data logger, recorded data must be physically downloaded to a computer at a later time for further processing. Therefore, the communication system is an essential element in an automated weather station. Today, automated weather stations are available as commercial products with variety of facilities and options. Although automated weather stations can be built and implemented in remote parts of Sri Lanka to bring down the cost of maintaining weather

stations, until recently, not much emphasis has been given for building and using such instruments locally. Automated weather stations have been developed in universities by interfacing meteorological parameter monitoring sensors to microcomputer/commercially available data loggers with communication devices or through serial and parallel ports to obtain hard copies of weather data. Recently, the University of Colombo developed an automated weather station with USB communication facility and a built-in data logging facility. The system used wired communication to transfer data to the monitoring station through the computer's built-in USB interface. The present work is a further extension of the earlier developments. The main objective of this work is to develop a standalone modular weather

station with a remote communication facility to capture and transmit meteorological parameters.

Remotely monitoring of environmental parameters is important in various applications and industrial processes. In earlier period weather monitoring systems are generally based on mechanical, electromechanical instruments which suffer from the drawbacks like poor rigidity, need of human intervention, associated parallax errors and durability. Kang and Park have developed monitoring systems, using sensors for indoor climate and environment based on the parameters mentioned in 2000. Combination of these sensors with data acquisition system has proved to be a better approach for temperature and relative humidity monitoring in 2005. Lasso in 1993 introduces the usage of surface acoustic wave's devices as temperature sensor. This demand the development of a microcontroller based embedded system for weather monitoring. Such a system should monitor and provide data for remote examine. The collected data by weather monitoring system can easily be exported to a PC via a serial port to make subsequent data analysis or graphic and digital storage thus automatic data collection is possible without giving up PC resources.

II. EXISTING & PROPOSED SYSTEM

In the previous research, a single master-multi slave microcontroller communication method has been developed. The microcontroller is able to communicate using unicast communication, i.e. the master gave orders to one slave address via the master-slave network that has star topology. Then the slave who has the same address which is requested will respond or take action in accordance with the master command. Modbus

Protocol is the rules of data communication with the master-slave technique. In these communications there is only one master and one or several slave which form a network. Master only do one communication at a time. Slave will only communicate if there is a command (query) from the Master and cannot communicate with another slave. Addressing modes used by the Modbus there are 2, i.e., unicast and broadcast.

The design and implementation of weather monitoring & controlling system is the model with the ability to perform data acquisition on temperature, gas, humidity and accelerometer sensors attached. And it can give these sensors data to ADC Port of LPC1768. It can also upload the data continuously to excel sheet in LABVIEW with the help of RS232 Cable and also receives SMS with the help of GSM.
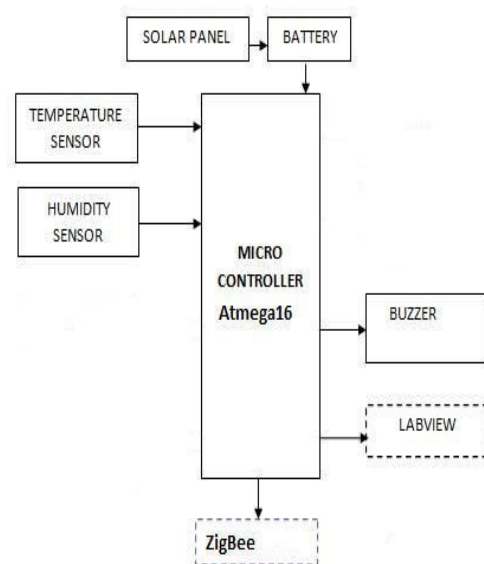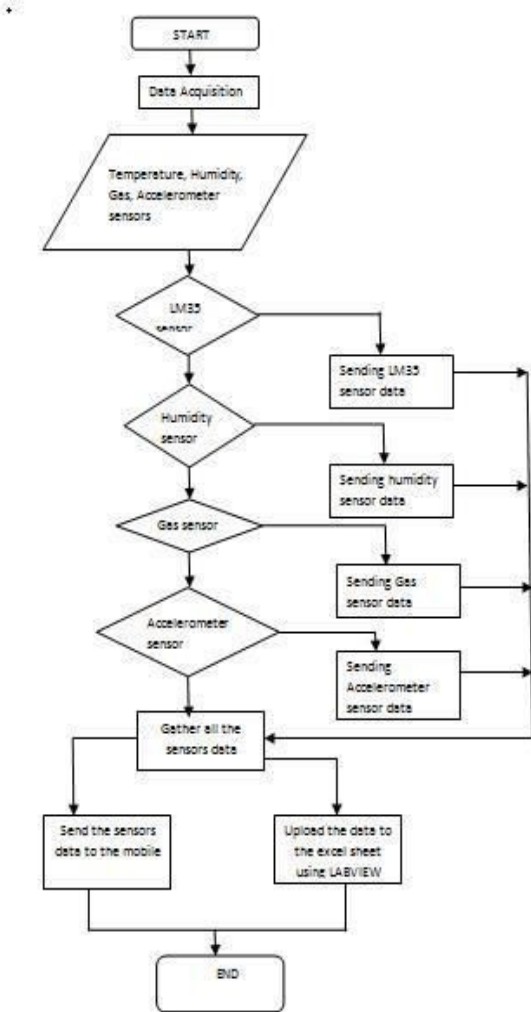
III. BLOCK DIAGRAM

Figure 1. Block Diagram

3.1 Humidity Sensor

Humidity sensor works on the principle of relative humidity and gives the output in the form of voltage. This analogue voltage provides the information about the percentage relative humidity present in the environment. A miniature sensor consisting of a RH sensitive material deposited on a ceramic substrate. The AC resistance (impedance) of the sensor decreases as relative humidity increases. The Humidity Sensor is shown in below Figure 2.

Figure 2. Humidity Sensor

3.2 Temperature Sensor

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to

Figure 3. Temperature Sensor

3.3 Gas Sensor

Sensitive material of MQ-6 gas sensor is SnO which with lower conductivity in clean air. MQ-6 gas sensor has high sensitivity to Propane, Butane and LPG, also response to

Natural gas. The Sensor could be used to detect different combustible gas, especially Methane; it is with low cost and suitable for different application. The Gas Sensor is shown in below Figure 4.

3.4 Atmega 16

It is a 8 bit high performance microcontroller from Atmel's family. It is a 40 pin microcontroller based on enhance risc architecture with 131 powerful instructions.

It has 16 kb programable flash memory and static ram off 1 kb and EEPROM of 512bytes.

IV. SYSTEM SOFTWARE

In this project two types of software's are used. They are

- ✓ KEIL software for c programming
- ✓ LABVIEW

μVision4 is an IDE (Integrated Development Environment) to help you write, compile, and debug embedded programs.
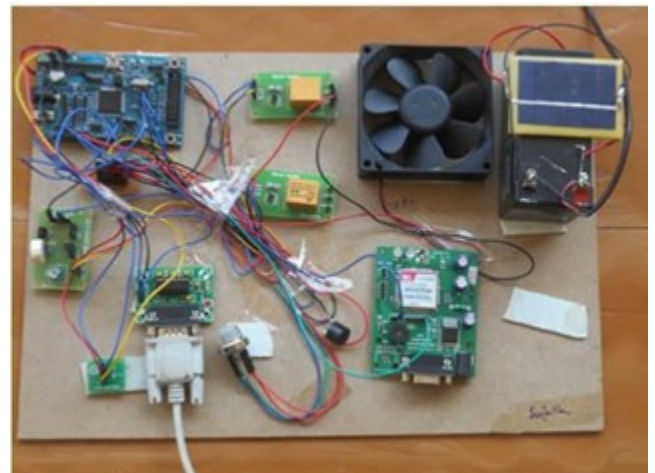
4.1 Flowchart

Hardware

Figure 6

In this project, we have to acquire all the environmental parameters like temperature, humidity, gas and accelerometer sensors and the measure these sensor values using ADC pins in LPC1768. Here in the above figure we use Multi sensor Board for placing the sensors, and accelerometer sensor for checking the earthquake condition. And for the power supply I'm using the 12v battery. Max Board is used for transmitting the data using serial communication. And also these sensor values will be displayed wirelessly on a Mobile using GSM Module.
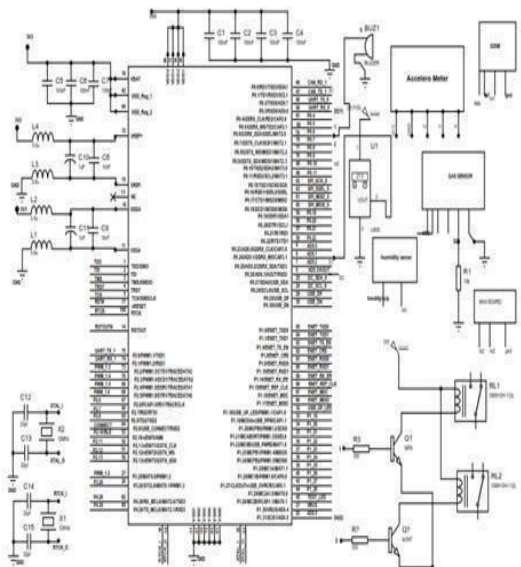
The data transmitting from the hardware can be received in Lab view using the serial communication. The read string displays the transmitted data. And here Different sensors & those corresponding values are displayed with the indications like Metering etc., And in the Lab view itself we create a Excel File And Place the excel file in that folder because the updating or value changes can also seen in the excel file like shown below.

Figure 5. proteus output

Figure 7

Figure 8.. Lab VIEW Result

V. APPLICATIONS & ADVANTAGES

5.1 Applications

1. Used in coal mine, bio gas manufacturing centers.
2. Used in power plant generation.
3. Agriculture field monitoring.
4. Home automation.
5. Industrial purpose

5.2 Advantages

1. This project can be used to save power.

2. Security purpose.

VI. CONCLUSION

This paper demonstrates Design and Implementation of Weather Monitoring & Controlling System used for controlling the devices as well as monitoring the environmental parameters. Embedded controlled sensor networks have proven themselves to be a reliable solution in providing remote control and sensing for environmental monitoring systems. The sensors have been integrated with the system to monitor and compute the level of existence of Accelerometer, gas, temperature and humidity in atmosphere using information and communication technologies. The sensors can upload the data in Lab view using serial Communication.

VII. FUTURE SCOPE

Adding of more sensors to monitor other environmental parameters such as Soil PH Sensor, CO2 and oxygen Sensor while allowing the replacing of current sensors if a wider range of measurements is desired. And also Integration of additional monitoring devices such as a Wi-Fi camera to monitor growth of agricultural product. And also the data can be uploaded to web server continuously.

VIII. REFERENCES

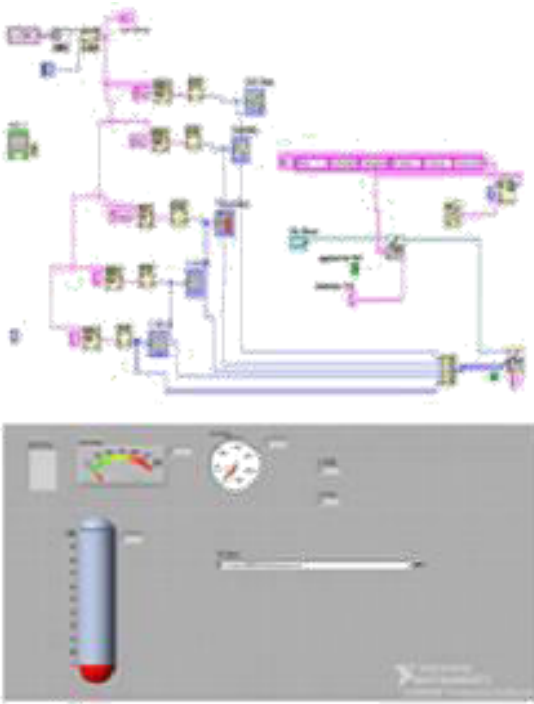[1]. Kang. J. and Park S. "Integrated comfort sensing system on indoor climate" Sensors and Actuators. 2000. 302-307.

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A Review on Propagation Models for Wireless Communication System

Ruhina Quazi, Zahera Naseem, Zahwa Mirza

Department of Electronics & Telecommunication Engineering, Anjuman College of Engineering & Technology,
Nagpur, Maharashtra, India

ABSTRACT

This paper gives an overview of the propagation models in wireless communication systems. Wireless communication system uses several physical media, ranging from sound to radio to light. These characteristics are affected by the physical environment between the transmitter and receiver. Wireless communication system suffers from various unwanted effects of fading which may be caused due to multipath propagation, path loss, shadowing, Doppler spread and co-channel interference. There are various signal propagation ranges in wireless communication channels.

Keywords: Characteristics of wireless communication system, path loss, fading, interference, types of propagation models-outdoor & indoor propagation model.

I. INTRODUCTION

The wireless communication system posses several challenges for the reliable and a high speed communication. It is not receptive of noise channel and other channel hindrance, but these obstacle changes with time in unforeseeable ways due to user movement. We will characterize in detail the variation in the received signal power over the distance due to path loss and shadowing. Path loss models describe the signal attenuation between a transmitter and receiver antenna as a function of propagation distance and other parameters which is caused by the dissipation of the power radiated by the transmitter as well as effects of the propagation channel. Shadowing is caused by obstruction between the transmitter and the receiver that attenuate the signal power through absorption,

reflection, scattering, and diffraction. A very important practical issue is to test and validate the ability of the "smart" antenna array to meet performance requirements. For this purpose, a channel model is needed to take into account the temporal and spatial characteristics of radio propagation.

II. WIRELESS CHANNEL

The wireless signal proliferate in space, based on the rule of physics. An electromagnetic Radio Frequency (RF) signal which proceed in a medium suffers an attenuation (path loss) based on the nature of the medium. In addition, the signal experiences objects and gets reflected, refracted, diffracted, and scattered. The cumulative effect results in   the signal getting absorbed, signal

travel across multiple paths, signal's frequency being shifted due to relative motion between the source and objects (Doppler Effect), thus are getting modified in a sufficient way. It is clear that the radio frequency signal is a space-time-frequency signal.

Where,

The wireless signal proliferate in space, based on the rule of

- ✓ G_t is the transmitter antenna gain physics. An electromagnetic Radio Frequency (RF) signal
- ✓ G_r is the receiver antenna gain which proceed in a medium suffers an attenuation (path loss)
- ✓ d is the distance between the transmitter and receiver based on the nature of the medium. In addition, the signal
- ✓ λis the wavelength of the signalexperiences objects and gets reflected, refracted, diffracted, and scattered. The cumulative effect results in the signal

Two-way model also called as two path models is widely used path loss model. The free space model givea detail amount of above assumes that there is only one single path from the transmitter to the receiver.

It is actually experienced that the signal reaches the receiver through the multiple paths. The two path model strugglesto capture this phenomenon. The model assumes that the signal reaches the receiver through two paths, one a line-of-sight and the other the path through which the reflected wave is received.

According to the two-path model, the power which is received is given by

$$P_r = P_t G_t G_r \left(\frac{h_t h_r}{d^2}\right)^2$$

Where,

Pt is the transmitted power
Gt represent the antenna gain at the transmitter
Gr represent the antenna gain at the receiver
d is the distance between the transmitter and receiver
ht is the height of the transmitter
hr are the height of the receiver

Fading

Fading mentions the fluctuations in strength of the signal when the signal is received at the receiver. Fading can be classified into two types –
Fast fading/small scale fading and
Slow fading/largescale fading
Fast fading refers to the swift fluctuations in the amplitude,

phase or multipath delays of the received signal, due to the interference between the multiple versions of the same transmitted signal arriving at the receiver at slightly different time interval.

The time between the reception of the first version of the

signal and the last echoed signal can be expressed as delay spread. The multipath propagation of the transmitted signal, which causes fast fading, is because of the three propagation mechanisms, namely –

Reflection

Diffraction

Scattering

The multiple signal paths may sometimes add constructively or sometimes destructively at the receiver causing a variation in the received signal's power level. The received single

envelope of a fast fading signal is said to follow a Rayleigh distribution to see if there is no line-of-sight path between the transmitter and the receiver.

transmission lie between the transmitter and the receiver.

Slow fading is so called because the duration of the fade may last for multiple seconds or minutes.

When the receiver is inside a building and the radio wave

passes through the walls of a building slow fading occurs. The blocking object causes an irregular variation in the power of received signal.

Slow fading may causes the received signal power to vary, though the distance between the transmitter and receiver remains the same.

Slow fading can also be expressed as the shadow fading since the objects that cause the fade, which may be large buildings or other structures, block the direct transmission path from the transmitter to the receiver.

Interference

Interference is the sum of all signal contributions that are neither noise not the wanted signal. Lets understand how its effect, its type and what possible source for it.

Effects of Interference

o   Interference is an important limiting factor in the performance of cellular systems.
o   Interference degrades the quality of the signal.
o   It initiates bit errors in the received signal.
o   Bit errors are partly recoverable by means of the channel coding and the error correction mechanisms.
o   The situation of the interference is not reciprocal to the uplink and downlink direction.
o   Mobile stations and base stations are introduced to different interference situation.

Sources of Interference

o   When another mobile is present in the same cell.
o   When a call is in progressin the neighboring cell.
o   When other base stations areoperating on the same frequency.
o   When any non-cellular system leaks energy into the cellular frequency band.

Co-Channel Interference

o   Co-channel interference occurs the because of frequency reuse, i.e. several cells use the same set of frequency.
o   These cells are called co-channel cells.
o   Co-channel interference cannot be combated by increasing the power of the transmitter. This is because an increase in carrier transmit power increases the interference to neighboring co-channel cells.
o   To reduce the co-channel interference, the cells
must be separated by a minimum distance to provide sufficient isolation due to propagation or reduce the footprint of the cell.

o   Some factors other than reuse distance that influence co-channel interference are antenna type, directionality, height, site position etc.

Indoor Propagation Models

It provides a alternative in to the nature of propagation over irregular terrain and the losses occurred due to obstacles in a radio path. The disadvantage of this model is it cannot assumes propagation effects due to foliage, buildings, and other manmade structures and does not supports multi path communication.

Free Space Path Loss

The free space path loss model is not directly related with the indoor propagation. As it is required to compute the path loss at a close-in reference distance as desired by the models. The free space model gives a measure of path loss as a function of T-R separation when the receiver and transmitter are under the LOS range in a free space environment. The model is defined by equation given below, which depicts the path loss as a positive quantity in dB:

$$PL(d) = -10 \log \left[\frac{G_t G_r \lambda^2}{(4\pi)^2 d^2} \right]$$

Where, G_t and G_r are the individual ratio gains of the transmitting and receiving antennas respectively, l gives the wavelength in meters, and d is the T-R separation in meters. When antennas are removed, we assume that $G_t = G_r = 1$. The free space path loss equation gives desired results only if the receiving antenna is in the far-field or Fraunhofer region of the transmitting antenna. The far-field denoted as the distance d_f given by equation below.

$$d_f = \frac{2D^2}{\lambda}$$

Here, D = largest linear dimension of the antenna. Additionally, for a receiver to be assumed in the far-field of the transmitter, it must satisfy $d_f \gg D$ and $d_f \gg \lambda$.

Log-Distance Path Loss

The log-distance path loss model assumes the path loss variations takes place exponentially with distance. The path loss in dB is given by equation (7.3).

$$\overline{PL}(d) = \overline{PL}(d_0) + 10n \log\left(\frac{d}{d_0}\right)$$

Where n gives the path loss exponent, d defines the T-R separation in meters, and d_0 defines the close-in reference

An Additive Path Loss Model

An additional path loss model which has been found out by researchers is named as an additive path loss model. In this model, individual losses occured due to obstructions between transmitter and receiver are approximated and added together. Researchers have proposed tables of recorded average attenuation values for different obstructions including walls, floors, and doors. However, maximum of the recorded information is related to only a few carrier frequencies. Furthermore, the resulting attenuations are not equal among various researchers.

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[17]. Zahera Naseem, Iram Nausheen, Zahwa Mirza "Prop agation Mod els for Wireless Commu n ication System ",IRJET Journal on selected areas in comm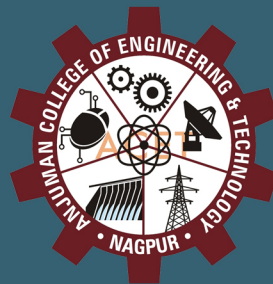unications,vol.05, no.01,January 2018.