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Smart Solution for Women Safety Using IOT

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ABSTRACT

Women safety is a very important issue due to rising crimes against women these days. Presently there is indeed no good solution to this problem. The existing applications and devices are not much effective as they need lot of human interaction to operate. These existing devices use to read the human temperature and heartbeat to generate alarm in case of emergency. When a person runs, every human may have different body temperature and heartbeat pattern and thus keeping a fixed threshold for finding out emergency situation and then generating alarm is not correct way and this is where the existing devices are failing to correctly generate alarm in case of emergency. In this paper the device are customized to learn the individual pattern of temperature and heartbeat and then it finds out the threshold for generating alarm. Thus this paper deals to design a wearable women safety device that automatically reads and create patterns such as body temperature and pulse rate during running. If readings are higher than the normal readings then it will automatically call and message more than one person along with the location so that actions can be taken. We have used temperature and pulse sensors that will detect the activity of the woman and that data of sensors will be sent to cloud where machine learning algorithm is applied to analyse the data generated. The data is first collected by sensors in non-danger conditions to train the algorithm, after that data is used for testing to gauge the accuracy and how close it is to our trained data. More is the accuracy more is the surety of danger and the emergency alarm will be there on emergency contacts. Thirdly, this paper deals with scenarios where there is no internet facility. To overcome the problem of internet we have used ZigBee mesh network, which helped the device to send the data to multiple hop distance.

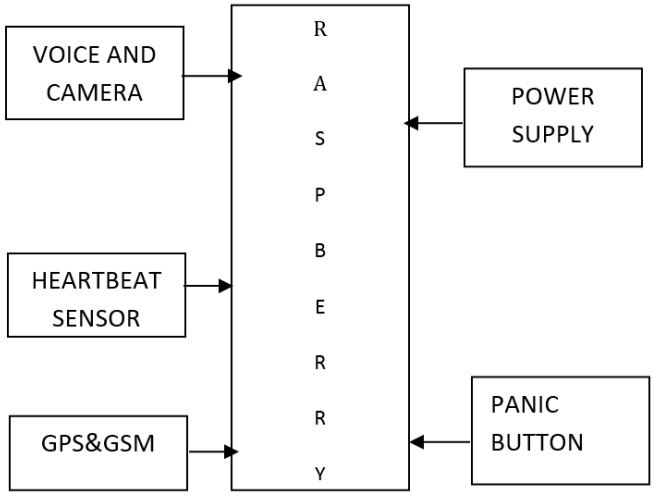
Keywords : IOT, Women Safety, Trained Data, Raspberry Pi, GPS, Zigbee, Charge-Coupled Device, CMOS, FDMA, TDMA

I. INTRODUCTION

Women are still facing unfortunate incidents like molestation, rape, acid attack etc. Many applications and devices are already there in the market but those are ineffective as they need to be manually operated. Since the mental state of the women is affected in danger conditions and sometimes it's not possible to operate them manually. So a solution was required which could eliminate the human effort to operate the device. So we came up with the idea of using machine learning algorithm to detect the danger automatically on the basis of biological changes like temperature change and pulse rate change that occur in human body when it is in danger. So our device contains temperature

and pulse sensors that continuously collect data and send that to cloud for computations. Cloud contains machine learning algorithm (logistic regression) which is trained with the actual data of danger and non-danger conditions and compute the incoming data on the basis of the training given to algorithm. On the basis of prediction done by computations, if danger is there then automatically an emergency alert message and call is sent to emergency contacts along with the location of the victim. This paper deals with scenarios where there is no internet facility. To overcome the problem of internet we have used ZigBee mesh network, which helped the device to send the data to multiple hop distance. By using zigbee mesh network, the proposed device can even work in any remote location where there is no internet.

1.1 Block Diagram



1.2 Literature Survey

[1] IoT based child and women safety:

The proposed system "IoT Based Child And Woman Safety" can be used to locating missing or lost children and also tracking the child movements outside from the home. The system can also be used to locate women who are in danger. We have combined GPS with one of the basic service of a smart phone which is GSM more specifically SMS in one system. Our proposed model contains various sensors which measure different parameters on a regular basis. In case of emergency a message will be sent to parents and/or police, by either pressing the panic button or pronouncing the keyword. The complete system is implemented using Raspberry Pi 3 Model B. Python programming is used interface all the sensors and other hardware.

[2] IoT Based Unified Approach for Women and Children Security Using Wireless and GPS

As the threats for Women and children increasing day by day we are proposing a system that works on the controversy of children and women security using IoT. The proposed system intends to a device wireless technique in the form of embedded device namely Arduino for women that will serve the purpose of alerts and way of communicating with secure channels and it captures the image using electronic camera. So to solve this issue of women safety we develop a wireless sensor kit which is easy to use and which is efficient to provide help to that victim.

[3] Smart security solution for women based on Internet of Things (IoT)

Today in the current global scenario, the prime question in every girl's mind, considering the ever rising increase of issues on women harassment in recent past is mostly about her safety and security. "848 Indian Women Are Harassed, Raped, Killed Every Day!!" That's a way beyond HUGE number! We propose an idea which changes the way everyone thinks about women safety. A day when media broadcasts more of women's achievements rather than harassment, it's a feat achieved! Since we (humans) can't respond aptly in critical situations, the need for a device which automatically senses and rescues the victim is the venture of our idea in this paper.

[4] **Smart girl security system**

Today in the current global scenario, the prime question in every girl's mind, taking into account the ever rising increase of issues on women harassment in recent past, is only about her safety and security. The system resembles a normal belt which when activated, tracks the location of the victim using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to three emergency contacts and the police control room. The system also incorporates a screaming alarm that uses real-time clock, to call out for help and also generates an electric shock to injure the attacker for self defense.

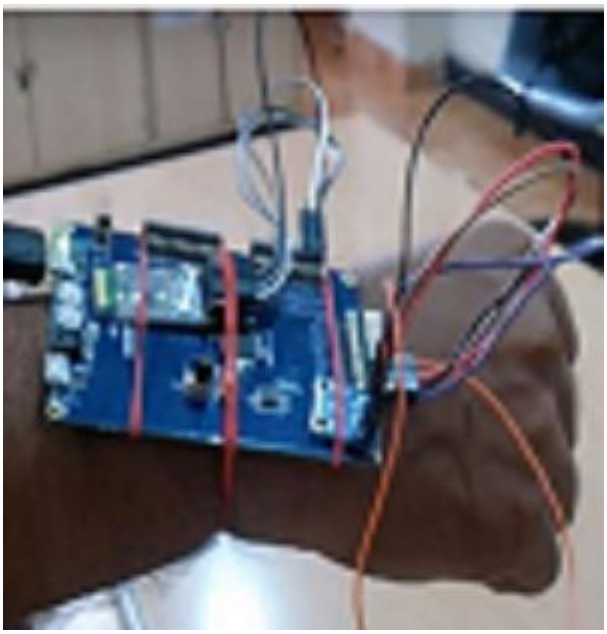
[5] Women safety device with gps, gsm and health monitoring system

In light of the present situation of the metro cities and other big cities, women security has emerged as one of the most important requirements in our country. The device consists of a switch, microcontroller (ATmega328P), GSM module (SIM900), GPS module (Neo6M), buzzer, and pulse sensor (SEN-11574). The main working of this project is that anytime a woman senses danger, all she has to do, is to hold on the button of the device. Once the device is activated, it tracks the place of the women using GPS (Global Positioning System) and sends emergency messages using GSM (Global System for Mobile communication), to already registered mobile number and the police control room. The use of sophisticated components ensures accuracy and makes it reliable.

II. PROPOSED SYSTEM

The proposed system is to design a portable device which resembles a normal belt. When the threshold of the pressure sensor crosses, the device will get activated automatically. Immediately the location of the victim will be tracked with the help of GPS and emergency messages will be sent to three contacts and one to police control room every two minutes with updated location. The screaming alarm unit will be activated and will send out sirens to call out for help. The system is also capable to generate an electric shock to harm the attacker which may help the victim to escape.

2.1 ARCHITECTURE OF PROPOSED SYSTEM



2.1 EXPERIMENT AND SIMULATION SETUP

Camera

A camera module is an image sensor integrated with control electronics and an interface like CSI, Ethernet or plain raw low-voltage differential signaling.A charge-coupled device (CCD) is a device for the movement of electrical charge, usually from within the device to an area where the charge can be manipulated, for example conversion into a digital value. This is achieved by "shifting" the signals between stages within the device one at a time. CCDs move charge between capacitive bins in the device, with the shift allowing for the transfer of charge

between bins.In recent years CCD has become a major technology for digital imaging. In a CCD image sensor, pixels are represented by p-doped MOS capacitors. These capacitors are biased above the threshold for inversion when image acquisition begins, allowing the conversion of incoming photons into electron charges at the semiconductor-oxide interface; the CCD is then used to read out these charges. Although CCDs are not the only technology to allow for light detection, CCD image sensors are widely used in professional, medical, and scientific applications where high-quality image data are required. In applications with less exacting quality demands, such as consumer and professional digital cameras, active pixel sensors (CMOS) are generally used; the large quality advantage CCDs enjoyed early on has narrowed over time.

GPS Module

Global Positioning System (GPS) is able to determine the latitude and longitude of a receiver on Earth by calculating the time difference for signals from various satellites to reach the receiver. In six different orbits approximately 12,500 miles above the earth, 24 MEO (Medium-Earth Orbit) satellites revolve around the earth 24 hours and transmit location every second as well as present time from atomic clocks and by monitoring blood flow through skin when is in contact with the wrist band at each pulse [8]

GSM Modem

GSM is used to send data from control unit to base unit .We can use GSM 300 which operates at frequency 900MHz. It has up link band of 890MHz to 915MHz and down link Band of 935MHz to 960 MHz GSM takes advantages of both FDMA & TDMA. In 25MHz BW, 124 carriers are generated with channel spacing of 200 KHz (FDMA). Each carrier is split into 8 time slots (TDMA). At any given instance of time 992 speech channels are made available in GSM 300 [8].

3. Mathematical Model

Set Theory Analysis:

S be the - Woman and Children safety Application as the

final set

S =identify the inputs as D, Q, E

S = D, Q, E

D = D1 - D given user details

Q = Q1, Q2, Q3 .

Q-gives the bus number which is to be tracked

E= E1, E2, E3 .

E- gives the Button click events

Identify the outputs as O

S = N, C, R

N= N1, N2, N3, N4 - N given Notification

C = C1, C2, C3 . — C gives the Current location

R = R1, R2, R3 — R gives the user details

Identify the functions as F

S = F = F1(), F2(), F3(), F4(), F5(), F6()

F1 (D) :: Get User details

F2 (D) :: Registration

F3 (Q) :: fetch current location

F4 (Q) :: Send current location

F5 (D) :: Send user details

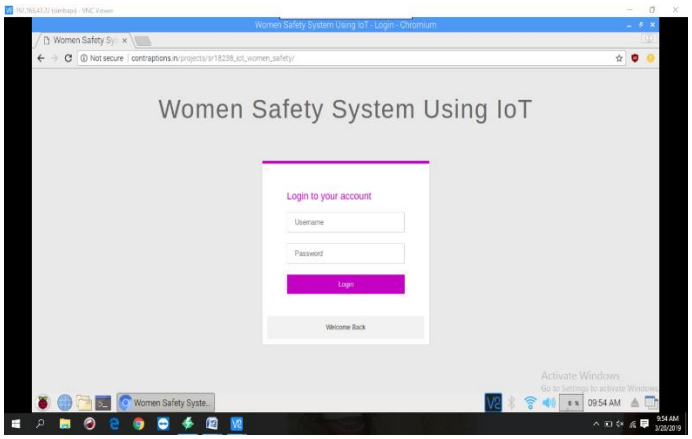
F6(E ,D) :: send notification

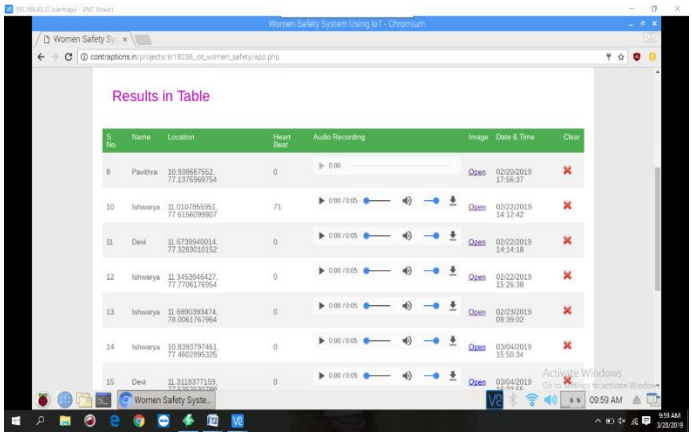
III. FUTURE SCOPE

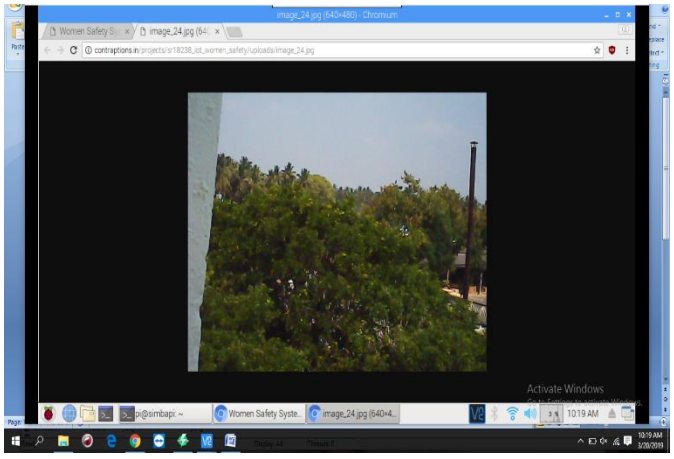
In this paper we have proposed the system for security of women and children. This paper presented a wireless method which will alert and communicate with secure medium. It will also capture image via camera. When the sensor kit button is pressed the camera will capture the image and will collect the information of the user. This information will be sent to the registered phone number along with the image link. This system will

Speed monitoring for children security can also be done by using the GPS tracking mechanism. The bus Unit will locate the bus and all its travelling routes. This system uses Haversine and Trilateration algorithm for tracking the bus. Alert messaging will be done on the registered phone numbers.

IV. RESULT AND ANALYSIS







V. CONCLUSIONS

The proposed system is to ensure the security of the women in the society by providing automatic sensing of threats and send the “HELP & POSITION” to the relatives and the Police Station using Internet of Things. Peace and prosperity lies in the society where women is happy and honored.

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