Anti-Poaching Alarm System for Trees in Forest Using Wireless Sensor Network

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ABSTRACT

Now a days there are numerous occurrences about pirating of trees like Sandal, Sagwan and so forth.Thesetreesareexpensiveandpitiful.Theyareutilizedinthemedicinalsciences, beautifying agents. To limit their sneaking and to spare woodlands around the world some preventive estimates should be conveyed. We have built up a framework which can be utilized to limit sneaking. The structure framework utilizes three sensors tilt sensor (to recognize the tendency of tree when its being cut), temperature sensor (to identify timberland fires), sound sensor (for successful discovery of unlawful logging for example indeed, even the sounds created while chopping out the tree are additionally detected). Information created from these sensors is constantly observed with the page. As for the sensors, their yield gadgets are initiated through hand-off switch. For tilt sensor and sound sensor, a ringer is enacted and for temperature sensor a water siphon is actuated. Created information is put a way in cloud Server over the Wi-Fi module. Woods authorities are advised when any occasion happens so proper move can be made.

Keywords: Pitiful–exceptionally little in sum, carrying–taking a think illicitly from a nation.

I. INTRODUCTION

Now a day's poaching or smuggling of environmentally and economically important species of trees in forested areas - such as Teakwood, Sandalwood, Pine and Rosewood has been dramatically increased. There have been several initiatives undertaken by different stakeholders – and in particular - by the Govt. of India, to mitigate these problems. These include the recruitment, training and deployment of anti-poaching watchers and/or private/govt. security guards across forests. Strict punishments for convicted offenders, as well as giving special incentives for anti-poaching activities (Twelfth Five Year Plan 2012-2017) were aimed for eradicating the menace. However, the punitive measures have remained largely ineffective, but still poachers was continue to thrive.

The most effective solution is– "the implementation of a real time, wireless sensor network (WSN) and data logging system" which will be a advanced and a cheap modern technology to make monitoring more robust, effective and feasible. WSN is a most emerging

technology, widely used in many industrial applications such as monitoring, maintenance, security and control application, specific in remote monitoring applications etc. In forest areas, WSN are widely used for fire detection in forest, to detect rearing/poaching of animals, for environmental monitoring, etc. Wireless Sensor Network facilitates easy installation and maintenance; they eliminate the use of expensive cables and save costs. With the help of WSN and some other sensors we can implement the system which used to reduce the poaching level in the forest areas.

II. LITERATURE SURVEY

IOT BASED ANTI-POACHING SENSOR SYSTEM FOR TREES IN FOREST

Presently a-days there are numerous episodes about carrying of trees like Sandal, Sagwan and so forth. Poaching of monetarily valuable trees has turned into a noteworthy dangerous to the estate of these trees, making an ecological irregularity and hazard the common assets. Distinctive activities have been taken world broadly including foundation of International Anti-Poaching establishment (IAPF).

To confine their pirating and to spare woodlands around the world some preventive estimates should be made. Have built up a framework which can be utilized to confine smuggling. This task shows a framework for observing woodland and its region depends on IoT based remote sensor organize innovation. This paper proposes a microcontroller essentially based enemy of poaching framework utilizing WSN innovation. The fundamental thought displayed in this paper include utilizing a cutting edge and a modern innovation in which poachers will be deserted and being gotten effectively there by disposing of Poaching exercises. The framework propose three unique activities of reactions, right off the bat. The second activity can be called perception where by various picture preparing methods of the got pictures encompassing a trees and in this manner

give a sufficient help with understanding what makes sudden development of the trees. The last activity is to send messages to the officer's PDAs about the trees and the area through sensor. Backwoods authorities are told when any occasion happens so fitting move can be made. Remote sensor organize innovation can help build up a vitality effective framework for checking the poaching of trees.

A SURVEY ON SENSOR NETWORKS

The advancement in wireless communications and electronics has enabled the development of low-cost sensor networks. The sensor networks can be used for various application areas (e.g., health, military, home). For different application areas, there are different technical issues that researchers are currently resolving. The current state of the art of sensor networks is captured in this article, where solutions are discussed under their related protocol stack layer sections. This article also points out the open research issues and intends to spark new interests and developments in this field.

WIRELESS SENSOR NETWORKS

Since large numbers of sensor nodes are densely deployed, neighbour nodes may be very close to each other. Hence, multihop communication in sensor networks is expected to consume less power than the traditional single hop communication. Furthermore, the transmission power levels can bekept low, which is highly desired in covert operations. Multihop communication can also effectively overcome some of the signal propagation effects experienced in long-distance wireless communication.One of the most important constraints on sensor nodes is the low power consumption requirement.Sensor nodes carry limited, generally irreplaceable,power sources. Therefore, while traditional networks aim to achieve high quality of service (QoS)provisions, sensor network protocols must focusprimarily on power conservation. They must haveinbuilt trade-off mechanisms that give the end userthe option of

prolonging network lifetime at thecost of lower throughput or higher transmission delay. Many researchers are currently engaged in developing schemes that fulfill these requirements. Inthis paper, we present a survey of protocols andalgorithms proposed thus far for sensor networks.Our aim is to provide a better understanding of thecurrent research issues in this field. We also attempt an investigation into pertaining designconstraints and outline the use of certain tools tomeet the design objectives.One of the most important constraints on sensornodes is the low power consumption requirement.Sensor nodes carry limited, generally irreplaceable,power sources. Therefore, while traditional networks aim to achieve high quality of service (QoS)provisions, sensor network protocols must focusprimarily on power conservation. They must haveinbuilt trade-off mechanisms that give the end userthe option of prolonging network lifetime at the cost of lower throughput or higher transmissiondelay.Many researchers are currently engaged in developing schemes that fulfill these requirements. Inthis paper, we present a survey of protocols andalgorithms proposed thus far for sensor networks. Our aim is to provide a better understanding of thecurrent research issues in this field. We also attempt an investigation into pertaining designconstraints and outline the use of certain tools tomeet the design objectives.

which are able to monitor a wide variety ofambient conditions that include the following

- temperature,
- humidity,
- vehicular movement,
- lightning condition,
- pressure,
- soil makeup,
- noise levels,
- the presence or absence of certain kinds of objects,
- mechanical stress levels on attached objects, and
- The current characteristics such as speed, direction, and size of an object.

III. SYSTEM ANALYSIS

EXISTING SYSTEM

Plundering of sandalwood trees is one of the key challenges faced by the department. Forest department has found an innovative way now to protect these – steel armours. "Before we put up this mesh, we lost some trees to the thieves. They are very quick, they cut down the trees and take them away in a few minutes. After we put up the steel cover, "Some thieves once tried to cut the trees even after the steel mesh had been installed. But they did not succeed and were arrested. But some cases many thieves are cutting the trees and escaped during night time. For monitoring large areas, there is a need for an automated system for longer lasting solution Tracking applications, GPS.

PROPOSED SYSTEM

The proposed WSN has:

➢ 15- 20 Sensor Nodes: Each Sensor Node will have sensor inputs as data of Accelerometer and sound sensor.

➢ 1 Master Node: Receives the messages from all the sensor nodes and forward it to Base station. It has additional Intelligence i.e. it processes the messages from the Sensor Nodes and raises the alarms levels.

➢ 1 Base Station: Receives the messages from more than one master node and logs the messages to the server.

➢ 1 PC based Server Software with GUI: To give audio visual alarms.

The developing such a system which can be used to restrict this smuggling. Every tree will be equipped with one small electronics unit which consists of Micro Controller, MEMS sensor, GPS and IOT module. In big forest, each tree will be having sensor unit which is fitted on stem of tree will Communicate with their server unit .The communication between

tree unit and server unit take place by using IOT module.

Tree cutting will be detected by sound sensor and MEMS. By using sound sensor we can predict the cutting tree. once the tree will fallen the nearest tree will sense the sound of fallen trees and send the signal to server. Sensor values having some fixed threshold value, once the threshold value will match to the current value, it will send the alert signal to server due to that signal the forest ranger may get more alert on that particular area. Due to nature disaster some trees may fallen, for that purpose we are using GPS module for continuous monitoring of trees location.

ADVANTAGE:

1. Easy to operate
2. Low power consumption
3. User friendly

IV. SYSTEM SPECIFICATION

HARDWARE DEATILS:

- Microcontroller
- Crystal
- Resistors
- Capacitors
- Diodes
- Regulator
- Transistors
- Keypad
- DC Motor
- RS232
- IR Sensor

SOFTWARE DEATILS:

➢ EMBEDDED 'C'
➢ Code Vision AVR
➢ AVR KIT 2
➢ VB 6.0

While Tree Cutting Temperature Sensor

Temperature sensors are contraptions used to measure the temperature of a medium. There are 2 sorts on temperature sensors: 1) contact sensors and 2) non contact sensors. Never the less, the 3 essential sorts are thermometers, restriction temperature locators, and thermo couples. All the three of these sensors measure a physical property (for instance volume of a liquid, current through a wire), which changes as a segment of temperature. Despite the 3 standard sorts of temperature sensors, there are different other temperature sensors open for use. Temperature sensor used in our endeavor is LM35.It's is an exactness IC temperature sensor with its yield in respect to the temperature (in °C).With LM35, the temperature can be assessed more definitely than with a thermistor. The working temperatures go is from -55°Cto 150°C.

Chart
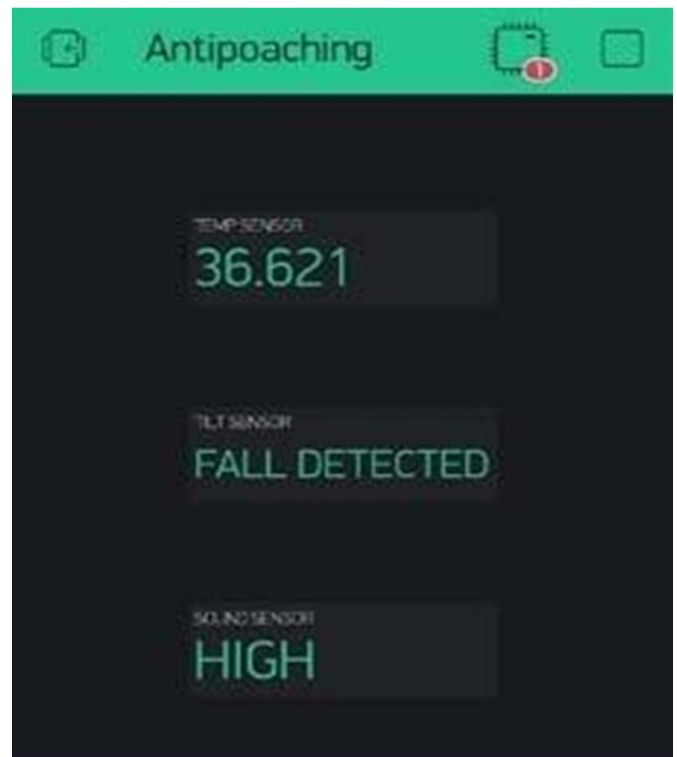
Sound sensor

The sound sensor module gives a basic strategy to perceive sound and is normally used for recognizing sound power. This module can be used for security, switch, and checking applications. Its precision can be

successfully adjusted for the convenience of utilization. It uses a mouth piece which supplies the commitment to a speaker, top marker and support. Exactly when the sensor recognizes a sound, it shapes a yield banner voltage which is sent to a micro controller then performs essential taking care of Relay Switch

High voltage electronic devices can be controlled using exchanges. A Relay is a switch which is electrically worked by an electromagnet. The electromagnet gets instituted with a low voltage, for example 5 volts from a micro controller and it pulls a contact to speak to the critical point in time a high voltage circuit. A standout amongst the most preferred stand point is you can do with an Arduino is controlling higher voltage (120-240V) gadgets like fans, lights, warmers, and other family unit apparatuses.

Working

At the point when the gadget gets fueled and is in its ordinary upstanding position, at that point the moving ball settles at the base of the sensor to shape an electrical conduction between the two end terminals of the sensor. On the off chance that the circuit takes care of business ball doesn't settles at the base of the sensor with the electrical.

Conduction way, at that point the circuit winds up open. The circuit turns out to be short out and the LED gets adequate current. Grouping Diagram

I. BLOCKDIAGRAM
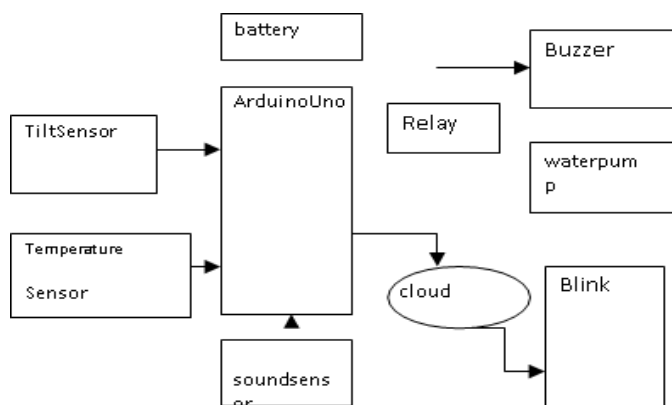
Power Supply

This is a basic way to deal with acquire a 12V and 5V DC power supply utilizing a solitary circuit. The circuit utilizes two ICs 7812and7805 for getting the required voltages. The AC mains voltage will be ventured somewhere around the transformer, amended by extension and sifted by capacitor to acquire a relentless DC level. The 7812 controls this voltage to acquire a relentless 12V DC.

Principle of Working

The standard of an infra-red sensor filling in as an Object Detection Sensor can be elucidated using the going with figure. An infra-red sensor involves an infra-red-light emitting diode and an infra-red Photodiode; to get her they are called as Photo–Coupler.

Right when the infra-red transmitter exudes radiation, it accomplishes the thing and a part of the radiation reflects to the infra-red beneficiary. In perspective on the intensity ofthe social occasion by the infra-red authority, they ieldof the sensor is portrayed.

Operation of Relay

At the point when little DC current moves through the loop of the transfer, curl empowers. Hence, the armature is pulled in towards the NO (Normally Open) stick. At the point when the present move through the curl stops, armature returns to the ordinary position, implies COM stick is associated with NC (Normally Connected) stick. Transfer activity is same for all fundamental transfers. A hand-off is an electro mechanical switch, it comprises of a loop. At the point when little flow moves through the curl, attractive field is prompted that makes the switch move, to close or open the electrical association.

Circuit Diagram for Relay Driver
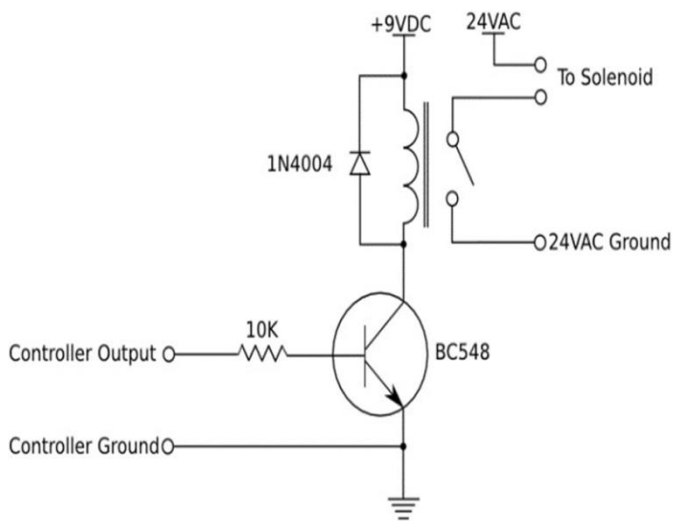
LCD Display

We get the significance of LCD from the name "Liquid Crystal" itself. It is extremely a mix of two states of issue –the solid and the liquid. They have both the properties of solids and liquids and keep up their different states with respect to another. Solids ordinarily keep up their state unlike liquids that change their presentation and move wherever in the liquid. Further examinations have shown that liquid valuable stone materials show to a more prominent degree a liquid state than that of a solid. It should in like manner be seen that liquid valuable stones are more warmth sensitive than anticipated liquids. A little proportion of warmth can without quite a bit of a stretch change the liquid diamond into a liquid. This is the inspiration driving why they are moreover used to make thermometers.

V. CONCLUSION

This undertaking presents a Microcontroller, sound sensor and IOT based WSN hub to distinguish robbery/sneaking adding to the insurance of vital and expensive types of tree. Reproductions and trial results have been contrasted with approve the proposed structure. The shared correspondence between the hub and the PC is executed here. The future extent of work is execution of Multi-hub

system and fuse of mouth piece, movement identifier sensor and temperature sensor to make frameworks increasingly powerful to obtain information such human or creature obstruction, fire location.

VI. FUTUREWORK

Deforestation can happen quickly until we stop tree smuggling in our forest area we want to increase our security area. It can also happen gradually as result of ongoing forest degradations temperature is e due to climate change cause by human activity.

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