Efficient IoT Preservation System for Wildfire and Poaching In Western Ghats

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ABSTRACT--- Aside from causing lamentable loss of lives and significant normal and individual properties including a huge number of hectares of woodland and many houses, backwoods fires are an incredible hazard to ecologically healthy grown forests and protection of the environment.Every year, thousands of forest fires across the world cause disasters beyond measure and outline. For many days we are readingwithin the newspapers about smuggling of the trees like sandal, "Sag wan" etc. These trees are very costly also less available within the world. These are use in the medical sciences also cosmetics. Because of huge amount of cash involved in selling of such tree woods many of incidents are happening of cutting of trees and their smuggling.Global System for Mobile Communication which we can monitor & controller the parameter like Tilt of Tree, Cutting of Tree, burning of tree through GSM network.

KEYWORDS----ARDUINOUNO, SENSORS, GSM MODULE, RELAY SWITCH

I. OBJECTIVES

Forests are the protectors of earth's ecological balance. Unfortunately, the fire is typically only observed when it's already cover over an outsized area, making its control and stoppage arduous and even impossible sometimes. The result is devastating loss and irreparable damage to the environment and atmosphere (30% of carbon dioxide (CO_2) in the atmosphere comes from forest fires) in addition to irreparable damage to the ecology (huge amounts of smoke and CO_2within the atmosphere). Among other terrible consequences of forest fires are long-term disastrous effects like impacts on local weather patterns, heating and extinction of rare species of the flora and fauna. The system is developed which can be used to restrict this rustling which would in turn stop deforestation and maintain the Environmental balance which would help to solve one of the issues with the Global Warming. The system consists of tree unit with three sensors, and this unit is fixed to tree, The Tree unit would be the primary unit for the implementation of the system. This unit would contain of three technologies to guard the tree from getting Hamper, Damage with fire, etc. The goal of this paper is to develop the system that alarm the smuggling of most precious trees such as sandal, red sandal, sag wan and other expensive medicinal plants. The proposed system employs techniques to guard the tree from getting Cut Down; Damage with fire, etc. this system transmits the location information to higher authorities to take immediate actions in case of smuggling and fire catch.

II. INTRODUCTION

In this introduction of anti-smuggling system for trees in forest we are implemented the system to avoid a nature disasters and to protect the sandalwood trees from the smugglers and Fire accidents parameter. The trees which are smuggled by smugglers are very huge cost, expensive and they will available less in the Indian markets. The smugglers are used to sell the scandal wood trees with huge amount and they used to cut the most expensive trees which it cost highly in INDIA and for their needs. Therefore there should be need to implement a device to security for the expensive trees which the smugglers can't steal the trees. So we are producing a new device system to security for the scandal wood trees and the safety for the forest environment. And we have developed a new system device which would be used for limiting of smuggling of trees from the smugglers and removes the deforestation. So that it would be used for the protection of forest environments which will helps us to be solved the problem condition like Global warming.

III. LITERATURE SURVEY

O.Younis, S. Fahmy.: HEED: A Hybrid, Energy Efficient, Distributed Clustering Approach For Ad Hoc Sensor Networks, In: IEEE Transactions on Mobile Computing 3 (4), pp. 366–379 (2004).. This paper proposes the impact of heterogeneity in terms of node energy in wireless sensor networks have been mentioned. Finally the simulation result demonstrates that H-HEED achieves longer lifetime and more effective data packets in comparison with the HEED protocol.

Kemal Akkaya, Mohamed Younis, "A Survey On Routing Protocols For Wireless Sensor Networks", Ad Hoc Networks 3, pp. 325-349 (2005). This paper surveys recent routing protocols for sensor networks and presents a classification for the various approaches pursued. Datacentric, hierarchical and location-based are three main classifications that are examined in this paper. Network flow and QoS modeling are also discussed.

FikretSivrikaya and B¨ulentYener wrote a paper about "Time Synchronization in Sensor Networks: A Survey". This paper reviews the time synchronization problem and the need for synchronization in sensor networks, then presents in detail the basic synchronization methods explicitly designed and proposed for sensor networks.

Bara'aA.Attea and EnanA.Khalil "A New Evolutionary Based Routing Protocol for Clustered Heterogeneous Wireless Sensor Networks" volume 12, Issue 7, July 2012. This paper propose the undesirable behavior of the EA when dealing with clustered routing problem in WSN by formulating a new fitness function that incorporates two clustering aspects, viz. cohesion and separation error.

signal with the concerned devices like mobile phones. Therefore the GSM system was developed with a digital system using a time division multiple access (TDMA) technique method for communication purpose towards the network. 800C SIM is a Triple band GSM(global system for mobile)/GPRS (General packet radio service) engine that works on dependent frequencies of extended global system for mobile communications (EGSM) 900 MHz, distributed control system (DCS) 1800 Megahertz(MHz) and personal communications service (PCS) 1900 Megahertz(MHz). Therefore the GSM can be used at the AT Command to get more information into the SIM card.

IV. HARDWARE ASPECTS

Tilt sensor

Tilt sensors are wont to measure angle within a limited range of motion. Tilt sensors are called as inclinometers because the sensors just produce a signal but inclinometers produce both readout and a signal. These devices produce an electrical signal that varies with an angular movement.

Fire sensor

A fire identifier works by recognizing smoke and additionally heat. These devices answer to the presence of smoke or extremely high temperatures that are present with a fireplace. After the device has been activated, it'll send a signal.

PIR sensor

PIR – Passive Infrared Sensor. It senses 180degree movement for 20meter area. It is used to detect whether a human has moved in or out of the sensor's range. When the sensor is idle, both slot delete an equivalent amount of IR ambient amount radiated from the space or wall or outdoors. At the point when a warm body like human or creature cruises by, it first captures one-portion of the PIR Sensor which causes a positive differential change between the two parts.

Sound sensor

The Sound Sensor may be a board that mixes a microphone and a few processing circuit. It not only provides an audio output but also a binary indication of the presence of sound and an analog representation of sound's amplitude.
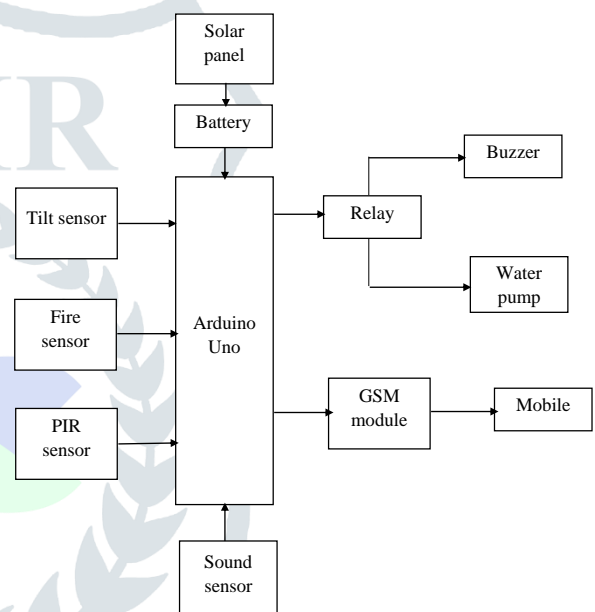
Relay switch

High voltage electronic devices are often controlled using relays. A Relay may be a switch which is electrically operated by an electromagnet. The electromagnet gets activated with a minimum voltage, for example 5 volts from a microcontroller and it pulls a contact to from or break a high voltage circuit. One of the most advantage is you can do with an Arduino is controlling higher voltage (120-240V) devices like fans, lights, heaters, and other household appliances.

GSM module

GSM is an open computerized cell innovation utilized for information transmitting versatile voice and information administrations works at the scopes of 850MHz, 900MHz, 1800MHz and 1900MHz recurrence groups. And GSM is a technology is used mainly in the data transmitting for the

V. BLOCK DIAGRAM

Power supply

The power unit consists of solar panel, lead oxide battery. The battery supplies voltage to the entire circuit. Solar panels, absorbs solar energy during day time and stores it within the battery. At the night time, this stored battery power are often used to run the whole circuit.

Principle of working

The block diagram .which consists of tilt sensor, sound sensor, fire sensor, PIR sensor, microcontroller, power supply, GSM module and mobile phone. Whenever there's any movement is that the forest or if the tree is being cut or just in case of forest fire the sensor sense and send message to the microcontroller. The message from microcontroller is shipped to the forest official through GSM module. The mobile no. of the forest official who is responsible gets registered in the GSM module. Therefore that person gets a message. The tilt sensor, fire sensor will placed at each tree but PIR sensor will be placed at just one tree. The tilt sensor, sound sensor will

send information to the microcontroller and buzzer will be ON. The fire sensor which will send information to microcontroller if environmental temperature is high then water pump is turn ON. The PIR sensor covers 180degree coverage therefore is there is any movement nearby it sends message. Therefore continuous monitoring of forest area is done.

VI. RESULT

The sensors are the main source of input to microcontroller. The messages that have been received by the forest official's registered mobile number. The first message "SOMEONE ROAMING INSIDE THE FOREST" is that the message that indicates that there's some person or animal nearby the trees. This is a yield gotten because of the discovery of the PIR sensor. The second message "TEMPERATURE HIGH" indicates that surrounding temperature of the trees has risen. This is an output obtained due to detection of the fire sensor.

The third message "SOMEONE CUTTING THE TREE" indicates that a tree is in the process of being cut down. This output is obtained by tilt sensor and sound sensor when any metal (in the form of a tool) comes in contact with a tree, the metal sensor for that specific tree recognizes and tells the backwoods authorities.

VII. CONCLUSION

IoT is the current trend in Government and corporate sector. Many big companies and industries are willing to move towards promoting of IoT. Government sectors many countries are planning to digitalization of endangered animals, like Welgevonden Game Reserve in South Africa have digitalized Rhinos from being poached using LoRa technology and IBM Watson IOT Cloud platform. Similarly many organizations are planning to digitalize valuable trees.

Future work

The future extent of work is execution of Multi-hub system and fuse of multipiece, movement identifier sensor to make framework increasingly powerful to obtain information such human or creature obstruction, fire location.

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