

Wireless Sensor Network for Anti-poaching of Trees based on IOT

Dr. P. Eben Sophia¹, M. Madhumitha², K. Sathya², V. Yogapriya², K.R. Harini²

¹Assistant professor, ECE, Karpagam College of Engineering

²Students, ECE, Karpagam College of Engineering

Article Info

Volume 82

Page Number: 13941 - 13944

Publication Issue:

January-February 2020

Article History

Article Received: 18 May 2019

Revised: 14 July 2019

Accepted: 22 December 2019

Publication: 26 February 2020

Abstract:

Smuggling trees like sandal, teak and so on. Such tree is both very costly and less expensive in the world. In addition, they are used as cosmetics in the medical science. The goal of this project is to save valuable trees, and in our proposed system we tend to create a system that can be used to prevent the importation of trees that could successively avoid deforestation and preserve environmental stability. The tree has with one electronic division Microcontroller, MEMS sensor, Temperature sensor, Global Positioning System, GSM module, Motor, Relay, MEMS system will be able to detect tree cutting. GSM module is to communicate between the trees and the computer.

Keywords: GSM, MEMS sensor, GPS, Arduino.

1. Introduction

Forest represents just about thirty percent of the world wide. They furnish natural surroundings to the two individuals and some animals sort that share the profitable environment's merchandise. Handling forest has become associate surprisingly exhausting enterprise. Illicit work speaks to one of the best difficulties of woods maintainability. For an extended time we have a tendency to area unit perusal within the papers regarding pirating of trees. These trees are all around extortionate. These are for the foremost part useful within the medical Science even as beautifying agents. Because of the large amount of cash involved in selling these tree woods and many incidents involving tree cutting and their importation is taking place.

This question is not simply known to India, but in China, Australia and African nations are facing the same problem. Putting value at the highest of the priority list, Indian wood prices 12000 to 13000 INR per kilogram although in world market red sandalwood order a high value of INR 10 center for each ton. The Indian sandalwood has proved to be in trouble as it is now, and the Indian government is attempting to control its possible destruction in an Effort to limit the export of wood. For a personal, most extreme passable purchase limit is not to surpass 3.8Kg consistent with government. The tree is as of currently government controlled, and Evacuation is forbidden on Non-public or sanctuary property, until the tree is 30 yrs old. Nevertheless, although some U.S. newspaper corner is the same title.

There are several pirating occurrences of trees such as Sandal, Teak and so on. Those trees were expensive and endangered. They were utilized for the medicinal

sciences, cosmetic agents several protective figures should be sent to restrict their secret and to spare woodlands around the world. They used some sensors like MEMS Sensor, temperature sensor. The information were gathered through these sensors and it is connected to cloud, from cloud stored information could be delivered to respective authorities using Wi-Fi module. The disadvantage of existing system is in that they used tilt sensor which accelerates or decelerates suddenly may also be unreliable and it deliver erroneous results under significant vibration condition. In our proposed system we use wireless sensor communication information is sensed by sensors such as MEMS sensor, Temperature Sensor for monitoring and collecting the data to cloud. For transmitting and receiving we use microcontroller, GPS, GSM and sprinkler motor for forest fire. Every individual node has set of sensors, and the one with maximum power supply, and the microcontroller receives the information and sends it to the cloud and the authorities concerned. The communication between tress and cloud is done by GSM module. WSN's principal drawback is its Continuous monitoring battery power.

2. Related Work

Narhari R. Kotkar (September 2004) at al-200 teak tree cut, timber conveyed LUCKNOW. Imperiled red wood from Berhampur sprinters. The city of china is home to a timber generation line that for each year includes more than 5 billion pounds of wood, much of which starts from Russia by means of Transport. Punjab News line Network on Saturday 18 December Month 2010. The situation has all gone terrible because timber, quality lakhs of rupees

are essentially below the belt disproportionately sold under the nose of the workplace involved. India's Time, Ahmadabad is committed to regulating the state's transportation of forest.

Naveenraj M, Arunprath, Jeevabharathi C.T (2019) at al-IOT based anti-poaching of trees, it set up a framework that could be used to restrict the concealment. The frame structure uses 3 sensing element tilt sensor, temperature sensor, sound sensor Information created from these sensor is discovered continuously with the application Blink. The created information is placed over the Wi-Fi module in the cloud server.

3. Existing System

The manual power had been used in existing system to combat tree and fire smuggling. To prevent injury to humans and the manual control we currently use the wireless network of sensor. The network of wireless sensors are many time unreliable, as it could be life-threatening. Manual power isn't enough to control large number of wildlife. This system requires regular manual monitoring of the entire forest area. It is a job to cover the vast area of land. Detecting the location of forest fire can be difficult task with this existing system. We uses display to show the post in our network we send a mobile message to the respective authorities about the live position and status of tree including path, count and forest condition.

4. Proposed System

This system uses MEMS sensor to detect the cutting down of trees, Temperature sensor for monitoring forest fire if the forest fire is detected temperature sensor sends output to ATMEGA328 microcontroller it automatically turn on the relay, relay actuates the sprinkler motor. If the forest fire or cutting down of trees happens location is tracked by GPS and message is sent to the respective authorities through the GSM module. This sensor information is stored in also cloud for analysis purpose.

Block Diagram

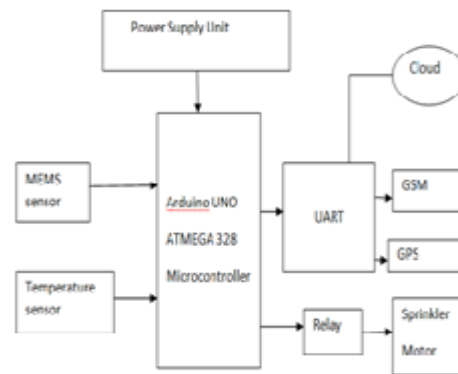


Figure 1: Block Diagram

Microcontroller

Arduino Uno is an ATmega328 supported microcontroller board with 14 input and output pins (6 of which are often used as PWM outputs), 6 analog inputs, 16MHz ceramic resonator, USB link, power Jack, ICSP header and reset button.

It contains everything you need to help the Microcontroller simply connects it to a laptop with a USB cable or powers it to get going with an AC to DC adapter or battery. Rather, it options the programmed AT mega 16U2 as USB-to-Serial converter. Board Revision 3 has the following features; 1.0 Pin additional SDA and SCL pins that are just about the AREF pin and two different new pins placed just above the RESET pin, the IOREF which allows the shields to adjust to the board voltage.

Arduino is an electrical interface based on open source, hardware and software. Inputs can be read by Arduino boards-light on sensor. It is used for electrical equipment and systems prototyping. The Arduino Uno offers various contact facilities for a smartphone, another Arduino or some other microcontroller, The ATmega328 offers UART TTL(5V) serial communication available on physical pins 0(RX) and 1(TX). On the wall, as a virtual com port, AT mega 16U2 channels this serial communication through USB to the pc software package. The Arduino software package includes a serial monitor that allows easy transmission to and from Arduino board of textual data. The RX and TX LEDs on the bard will flash when the information is transmitted via the USB serial chip and USB link to the laptop, but not for serial communication on pin0 and pin 1. A Windows Serial library permits any of Uno's wireless pins for serial communication. Additionally the ATmega328 facilitates communication with I2C and SPI.

5. Result and Analysis

The graph uploaded to cloud can be shown in Fig.5. Values lies between 0 and 1. Value “1” indicates cutting of tree where as “0” indicates tree is in normal position.



Figure 5: Tree Graph



Figure 6: Message Alert

The Fig.6 shows an alert Message about inclination of tree and temperature of the forest. When sensor information is satisfied with reference data.

6. Conclusion

We are designing the framework that can limit the forest tree smuggling where the human being cannot provide protection. We are implementing such system in the forest where the trees are costly and their protection is important fact. We are providing such a program in this region. We may rise the dumping of tree in this way. Using this form, valuable trees can be saved from forest robbers.

References

- [1] M, Arunprasath, Jeevabarathi C.T, Srinivasan R “IoT Based Anti Poaching Alarm System for Trees in Forest”, International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-8 Issue-6S, April 2019
- [2] Akshay D. Sonwane, V. N Bhonge, Ajay Khandare “Design and Development of Wireless

- [3] Sensor Node for Anti-poaching”, IMS Department S.A.M.E.E.R, Mumbai-400070 India, INSPEC:16498148, April 2016
- [4] Bhuta, Ajay Khandare, Rakhshan Anjum Shaikh,” Protocol Implementation for Wireless Sensor Network for Anti-Poaching of Trees”, Electronics and Telecommunication Department, SVKM's MPSTME, Mumbai, India, ISSN: 1759-8697, March 2017
- [5] Smita Gaikwad, Rajesh Patil,” Design WSN Node for Protection of Forest Trees against Poaching based on Zigbee “, Department of Electrical Engineering, VJTI, and Mumbai 400 019, India, ISSN: 1572-8443, July 2015
- [6] Ghousia Sultana B, Jagadish R, Nadiya Noor Syed, Nagashree C”Iot Based Anti-Poaching Alarm System For Trees In Forest Using Wireless Sensor Networks”, Dept. of Computer Science ,Sai Vidya Institute of Technology, Bangalore, India, ISSN:0976-5697,volume-9 Issue -3, May 2018
- [7] Anil Kulkarni, Ajay Khan dare, Mandar Malve, “Wireless Sensor Network (WSN) for protection high cost trees in remote jungles from fire and poaching” „International Seminar on Sandalwood: Current Trends and Future Prospects, Feb 2014, pp.68-73.
- [8] Jingjing, Z.; Yongxi, H.; Yufei, C., "Wireless sensor network multi-path routing protocols," Journal of Computer Engineering and Design, vol.28, no.22. pp. 5417-5420, 2007.
- [9] Narhari R. Kotkar, “Anti Smuggling System for Trees in Forest using Flex Sensor and Zigbee” IJAR CET, September 2014.