

Cloud Based Forest Fire Alert System using IoT

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ABSTRACT

The most common hazard in forest fire Accident are themselves destroy the forest and great threat for wildlife and peoples. The number of trees has reduced drastically so the forest are creates an unhealthy environment for animals to survive in the forest. Forest covers 31% of the world and 21% of the India. It has found in a survey that 80% of losses are caused due to fire. This project of a system fire was detected early stages. It was tracking and alarming for protection of trees against forest fire. Now IOT (Internet of things) devices and cloud based to forest fire alerting system. If cloud can used to storing the information of data to monitoring the different environmental variables such as temperature, smoke, moisture of the forest. So finally to prevent the fire to spread over a huge area and precaution the forest.

Keywords: Arduino UNO atmega328p, temperature sensor, smoke sensor, LCD Display, mobile Wireless communication.

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I. INTRODUCTION

Forest fire detection become one such issue. Due to forest fire has caused serious environmental Problems and devastation of flora fauna. The current turbulent global economic, demographic, social and ecologic context, government, local administrative authorities and commercial companies or individuals have the importance resources contained in forest environment. Forest ecosystems are dynamic and complicated. Disturbance to any part of network affect the balance of relationship and equally complete scheme either absolutely or negativity. so global climate change, drought and different conditions have caused occurrence of wildfire to extend, once wildfire occur it takes years to naturally recover. Forest fire is an uncontrolled fire occurring in nature and man-made. Once fire starts ignited it rapidly spreads all over area in the forest. The land were forest is burnt it became impossible to grow vegetation over there. This is because soil becomes water repelled and accepts no more water. Leading to reduction of ground water level. Fire causes huge loss of lives and properties every year. The national crime records Bureau indicates that there have been of 113972 fatalities due to fire accidents of the year 2010 to 2014. one of the most destructive properties of fire is that it spreads exponentially and with the right medium can spread uncontrollably. This is why timely detection of fire of fire is necessary for avoiding a fire hazard. The internet of things is a collection of sensor, actuators, software, embedded with electronics, connect each other with cloud. It is an also economic benefits. IOT make everyday life easier for humans by developing smart devices.

If increased IOT devices 31% at 8.4 billion in the year 2017. IOT involves connecting objects beyond the range of standard device which are used for every day purpose. The Arduino UNO at mega 328p for open platform for IOT to program easily and IOT devices also used to interface the embedded system and application of users. Temperature sensor used to measure the temperature level, smoke sensor is used find smoke type of quantities. If cloud to communication the devices.

II. PROPOSED SYSTEM

The proposed system is cloud based forest fire alert system using IOT technology. In the advancing world, it is very crucial to protect our environment. The fire cause serious change and disturbance to wildlife and human life. In wild animals are most affected and die also known for forest fire. If forest trees also burned to affect atmosphere, environment. This fire made naturally and man-made. So this project need to prevent and pre-cautions from forest fire. In order to achieve the best fire detection result with faster time to detect the temperature variation. When temperature sensor used to measure the temperature variation. Smoke sensor is a device that dense smoke, typically as an indicator of fire. Arduino at mega 328p used to control and monitor the activities. Cloud is a storage purpose to use him. Because each and every second to monitoring the environment condition data can be stored. IOT Device to interface with Arduino and cloud. so finally fix the monitoring system done

in nearby forest office station. The detail about the system is connected with a computer system monitored by the officer.

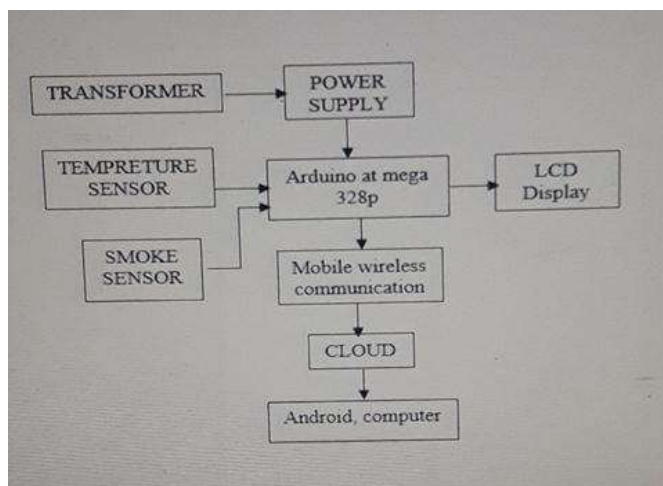


Fig 1. Block Diagram

III. HARDWARE IMPLEMENTATION

A. TEMPRATURE SENSOR

Temperature sensor normally used to measure variation of the temperature in particular area in range. In LM35 is basic temperature sensor that can be used for experimental purpose.

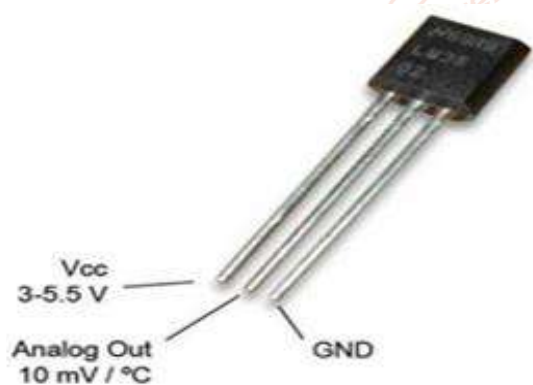


Fig 2. Temperature sensor

In this sensor output voltage value directly linear propositional to the Degree Celsius (centigrade). The advantage of this sensor more memory processing and communication capabilities. Power supply is -2 to 35v and temperature Range -55⁰ to 150⁰c.

B. SMOKE SENSOR

Smoke sensor mq-2 is used to detect smoke and flammable combustable gasses in atmosphere. Good sensitivity to alcohol in wide range, long life line, low cost. Output is a reading in analog voltage. The sensor measure of flammable gas range is 200 to 1000 ppm. Operating voltage 5v.



Fig 3. Smoke sensor

C. BLUETOOTH

The Bluetooth HC-05 is a very cool module which add two way wirelessly functionally the project. It connect a small devices like TV, mobile phones. It is easy to use serial port protocol. Operating frequency band is 2.4 GHZ. Flash memory size is 8-bit. And operating voltage is 3.3v.



Fig 4. Bluetooth

D. ARDUINO ATMEGA 328P

Arduino at mega 328p is an open source electronics platform. The main advantage is easy to use hardware and software. It has 14 digital input/output. At mega 328p is an 8-bit micro controller based on AVR RISC. So preparing this microcontroller for flashing the Arduino bootloader. Operating voltage is 5v and the clock speed is 16MHZ.



Fig 5. Arduino At mega 328p

E. LCD DISPLAY

An LCD is an electronic display. Which uses liquid crystalline display produces a visible image. The 16*2 LCD Display is very basic module commonly used for DIYs and circuit. Which translates the 16 character per 2 such a line. In advantage is sharpness, brightness, high peak intensity produces. Operating voltage is 4.7v to 5.3v.



Fig 6. LCD Display

F. CLOUD

Cloud is a very important big level storage place and interconnect the computer, mobile phones with internet. Cloud is mainly used to storage the data and information will be shared.



Fig 7. Cloud computing

If embedded system sends the monitoring data to server access and maintained. In public cloud use the project to server to provide the information via internet.

IV. CONCLUSION

Forest is a very important and grow in many places in around world. In a forest is piece of land with many trees. Many animals to live and survive the forest. Forest also used to prevent soil erosion, climate changes. This paper, a cloud based forest fire alert system using IOT technology. Temperature is increased or smoke typically fire indicate to LCD display. The real time sense a data will send and stored cloud. Finally information of the different parameter to be monitor forest officer and nearby forest survival peoples.

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