

FOREST FIRE DETECTION BASED ON GPS TRACKING TO PREVENT EXTENCTION OF WILD LIFE

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Abstract:

The analysis of environmental conditions in real time could provide relevant data on the environment that could help prevent or detect an emergency situation. Nowadays using different IOT (Internet of things) devices and sensors we can monitor the environmental variables such as temperature, pressure and concentration of pollutant gases. Changes and combination of these could cause natural disaster, such as forest fire. IOT and sensor based has been important aspect. In this proposed system sensors and micro controllers are incorporated to detect the hazardous situation.

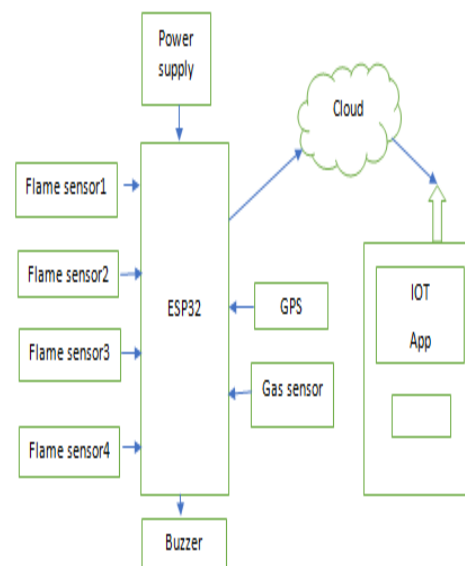
KEYWORDS:Radical , IOT,sensors, micro controller.

2.Introduction: Forest is major resource for human life. In present days we are facing unusual forest fires due to environmental pollution. Certain reasons for these could be security lapses and improper control, plans for alerting system. To address these an information system has been designed using sensors and IOT devices. This device will help us to prevent causing such disasters by alerting us based on temperature and smoke caused during forest fire. With such measures we can have increased options for detecting and controlling major hazards and spread.

3.Working Principle:

when fire takes place at any divided region of the forest flame sensors which are placed at four corners in the kit to cover all four directions will sense the fire and send signal to the micro controller (ESP32), ESP32 the gets the location by the help of GPS and sends message to the officer by using BLYNK app which will have inbuilt message sending protocol.

4. Block Diagram:



5.Hardware Requirements:

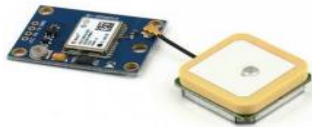
i.Flame Sensor: A furnace flame sensor works by detecting the presence of a flame within the furnace.



i. Flame sensor



ii.Gas sensor



iii.GPS Module

ii.Gas sensor: Smoke alarms detect fires by sensing small particles in the air using a couple of different kinds of technologies and send signal to micro controller.

iii.GPS Module: GPS modules contain tiny processors and antennas that directly receive data sent by satellites through dedicated RF frequencies.GPS receivers actually work by figuring out how far they are from a number of satellites.

iv.ESP32S(Micro controller): A feature-rich MCU with integrated Wi-Fi and Bluetooth connectivity for a wide-range of

applications. ESP32 is capable of functioning reliably in industrial environments, with an operating temperature ranging from -40°C to $+125^{\circ}\text{C}$.

v.Buzzer: A buzzer or beeper is an alerting device in case if there is any confusion with the GPS tracking.



iv.ESP32S(Micro Controller)



v.Buzzer

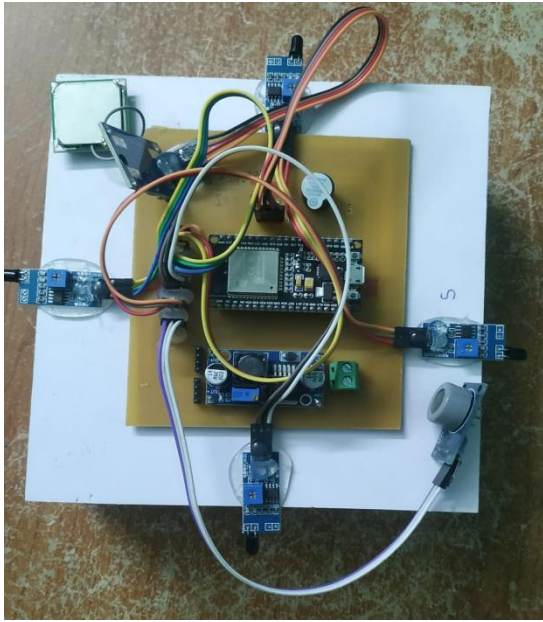
6.Software Requirements:

i.Arduino IDE: It is a type of software in which we write (or) edit code in order to make it work for different tasks (or) ways.

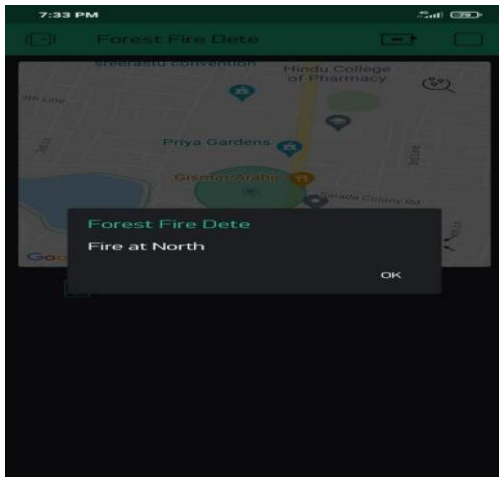
ii.Blynk Library for Arduino IDE: It is a type of library which consists of shortcut keys which are used while writing codes to make changes in the circuit in order to make it work for different purposes.

iii.ESP32 Link: The ESP32 provides a Wi-Fi connection for external devices. These devices can be computers, phones, tablets etc.

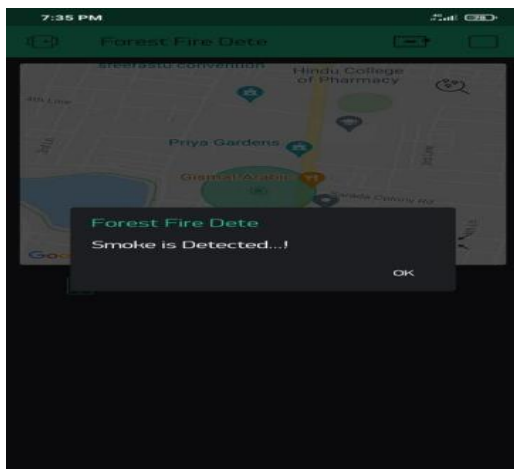
7.Results:



Developed Project



Output of flame sensor



Output of gas sensor

8.Conclusion:

With this system it enables detection of forest fire at the early stage, before the damage becomes high. This project would be useful in several areas such as forest fires, industries and buildings, as it sends message as soon as fire is detected and also an alert is produced by buzzer.

9.Future Scope:

i.Additional pump can be added so that it automatically sends water when there is a fire breakout.

ii.Fire detection in forest could also be possible if we used temperature sensors and humidity sensors along with the device which can also avoid wastage of valuable trees. Forest not only provides home to the large variety of flora and fauna, the animals but also the major producer of oxygen to the ecosystem.

iii.The sub server unit can be used between the transmitter unit and the main receiver unit which makes the whole procedure evenly proportional and take preventive measures to alert the forest officer.

9.References:

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