



# IOT BASED FIRE DEPARTMENT ALERTING WITH USING ARDUINO

<sup>1</sup>Professor Dr. S V D Anil Kumar,<sup>2</sup>Pujari Siva Kumar,<sup>3</sup>Rajkumar Challapalli,

<sup>4</sup>Asadi Sai Siva,<sup>5</sup>Vankayapati Mahesh babu

<sup>1</sup>Professor (Electrical & Electronics Engineering) <sup>2,3,4,5</sup>Bachelor Students

<sup>1,2,3,4,5</sup>Department of Electrical & Electronics Engineering

<sup>1,2,3,4,5</sup>St.Ann's College of Engineering and Technology,Chirala(Autonomous),Andhra Pradesh,India

## ABSTRACT

It is an IOT based paper where designed and implemented to Fire Detection and Alerting System. Fire Detection and Alerting System refers to Intelligent Fire Detection and Alerting System. It aims to develop the secure society without grow any harmful effects. This system incorporates advanced sensors such as fire sensors, DHT 11 sensors, and Passive Infrared (PIR) sensors, along with a Wi-Fi module for data transmission. The collected data is processed to detect potential fire incidents, and alerts are sent to a mobile application for real-time notification. Additionally, a local LCD display provides on-site visual alerts and a buzzer is used to sound purpose.

**Keywords:** Arduino UNO, WiFi Module (Esp8266), DHT 11 Sensor, Fire Sensor, PIR sensor, LCD, Buzzer

## I. INTRODUCTION

Ever since human being started building structures by using of wood rather than stone, fire has become the part of the total process. Nowadays, many industries and residential have installed related fire safety and control arrangements such as fire alarm, fire extinguisher, water sprinkling supply system. But in actual practice these all-fire alarm and controlling systems they are not that much capable enough to take necessary action when fire is started that's why to protect life.

The new way to avoid all the losses is to respond to emergency situations as quickly as possible. So, at that point comes the need of a upgraded fire detection systems. This project therefore look for to design an Arduino Fire Alarm and Controlling systems that will monitor the presence of significant quantity of temperature and smoke and activate alarms and along with that switch off the mains of the building, send an SMS to respective send an SMS alert and location and extinguish the fire as a safety measure to contain the situation.

## II. PROBLEM DEFINATION

Fire detection and Alerting System has faced a lot of Problems. In recent years getting more popularity on secure in the fire detection. To avoid problems we used a lot of sensors i.e Fire, DHT11, PIR (Passive Infrared) we are connecting these all things to Node MCU and Arduino UNO.

## III. OBJECTIVE

1. The Node MCU can process the all sensors which those are connected to Arduino UNO and Node MCU.
2. The main objective is to detect the fire, temperature, Humidity, Objects after send a message to which connected devices like LCD and app.
3. The Buzzer is sounding after detecting the fire and any objects.
4. we will monitor the Temperature, Humidity, Fire, objects through the LCD and App.

## IV METHODOLOGY

The fire alarm detection system consists of an Arduino Uno microcontroller board as the central processing unit. The system integrates the following sensors

Additionally, a WiFi module (e.g., ESP8266) is incorporated into the system to enable wireless connectivity for remote monitoring and communication. The WiFi module allows the system to send alerts and notifications to a remote monitoring station in real-time.

Furthermore, a liquid crystal display (LCD) is integrated to provide visual feedback on sensor data and alarm status. A buzzer is also connected to the Arduino board to provide auditory alerts in the event of a fire hazard.

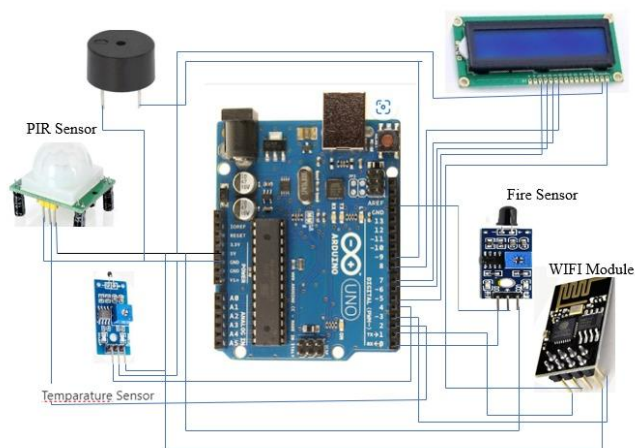
## V. WORKING

In this project user can put the objects or fire in front of sensors. After detecting the Fire or any object it send message to Node MCU. It Process the information what they get.

After Processing the data in Node MCU. It can send the Microcontroller that can send a message which is connected devices (i.e output devices). Devices will show the result as detected or not.

It can send a messages to application which is connected to mobile (i.e smoke detection app)

## VI. CIRCUIT DIAGRAM



The above diagram represents the connection between sensors, buzzer, LCD. The analog pins are connected to the output pins. The vcc pins are connected to vcc pins. The Gnd pins are connected to Gnd pins. The sensors output pins are connected through analog pins. The four pins LCD is connected to analog pins. Gnd, vcc. The Arduino Board and Wifi Module are controlling the operations.



## VII. RESULTS

The fire alarm detection system was evaluated in various test scenarios to assess its performance and reliability. In controlled environments, the system successfully detected changes in temperature, presence of smoke, and human motion, triggering alarms and sending notifications via WiFi to a remote monitoring station. The LCD display provided real-time visualization of sensor data and alarm status, while the buzzer emitted loud auditory alerts, ensuring prompt notification of occupants.

## VIII. CONCLUSION

The integrated fire alarm detection system presented in this paper offers a cost-effective and versatile solution for early detection and warning of fire hazards. By leveraging Arduino microcontroller platform and integrating multiple sensors, wireless connectivity, and visual and auditory alert mechanisms, the system provides robust performance and reliability in detecting and responding to fire incidents. Further research and development efforts are warranted to refine the system's capabilities and address any remaining challenges, with the ultimate goal of ensuring the safety and security of buildings and occupants.

## IX. REFERENCES

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