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IOT based Fire department alerting system

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INTRODUCTION

- Fire detection and alarm systems serve as vital tools in safeguarding lives and property by providing early warning of potential fire incidents.
- These systems are designed to detect smoke, heat, or flames, enabling timely intervention to prevent catastrophic outcomes. By promptly alerting occupants and emergency responders, these systems facilitate swift evacuation and firefighting efforts, minimizing the spread of fire and reducing damage.
- Moreover, advancements in technology have enhanced the capabilities of fire detection and alarm systems, offering increased reliability, efficiency, and integration with building management systems. In this paper, we delve into the importance of these systems in mitigating fire risks, exploring their components, functioning, and the latest innovations driving their evolution. Understanding the critical role of fire detection and alarm systems is paramount in ensuring effective fire safety measures in residential, commercial, and industrial settings.



PROBLEM STATEMENT

- Knowing the fire detection and alarm systems warn about fire outbreaks and allow action to be taken before conditions become out of control.

PROBLEM DESCRIPTION

- Design an efficient and reliable fire department alerting system that ensures timely and accurate notification of fire incidents to emergency responders , with the goals of minimizing response times , reducing property damage , and saving lives.

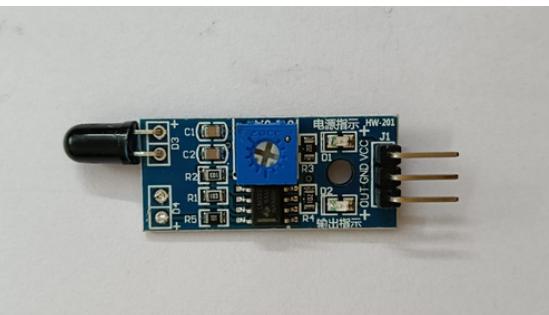


- The IoT-based Fire Department Alerting System revolutionizes emergency response. Leveraging interconnected sensors and data analysis, it detects fire outbreaks swiftly, transmitting real-time alerts to the fire department.
- Through efficient communication protocols, it pinpoints the exact location, enabling rapid deployment of firefighting resources.
- This system ensures prompt action, minimizing property damage and enhancing public safety. It integrates a network of sensors strategically placed in buildings or areas susceptible to fires.
- These sensors continuously monitor environmental changes such as temperature, smoke, and other indicators of fire. These alerts contain crucial information including the precise location of the fire, enabling rapid and targeted response, thus significantly reducing the response time and mitigating potential damages.
- The system aims to revolutionize traditional fire alert systems by leveraging IoT technology for quicker, more efficient, and precise firefighting responses.

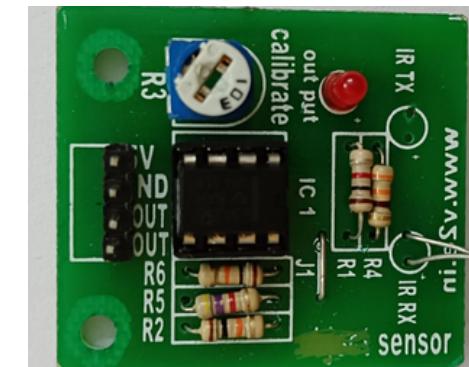


LIST OF COMPONENTS

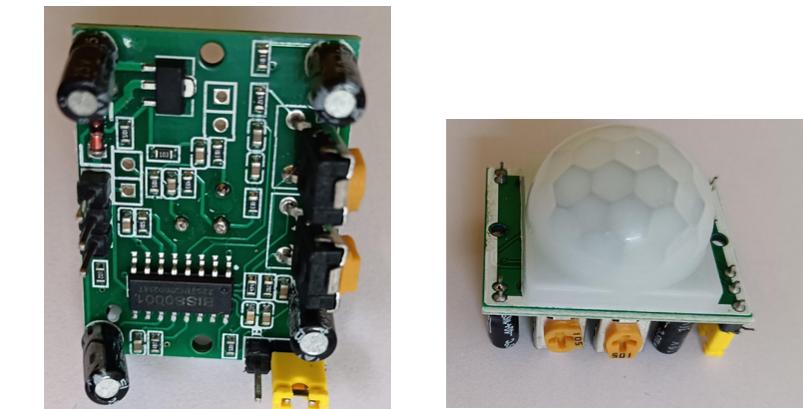
FIRE SENSOR



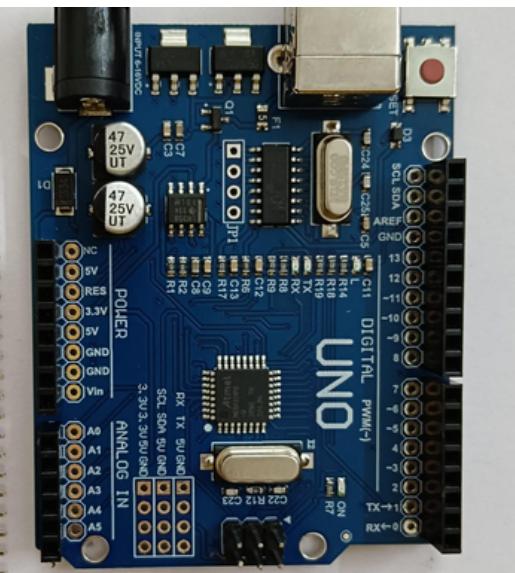
TEMPERATURE SENSOR



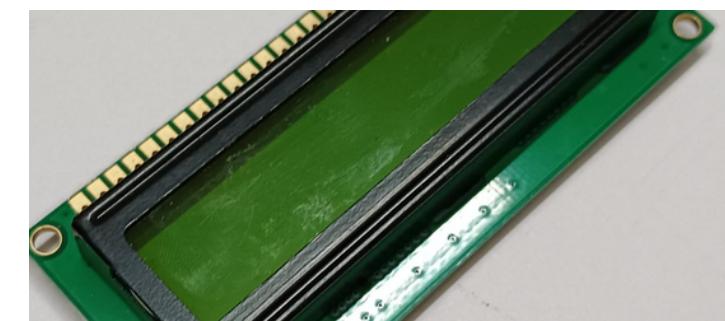
PIR SENSOR



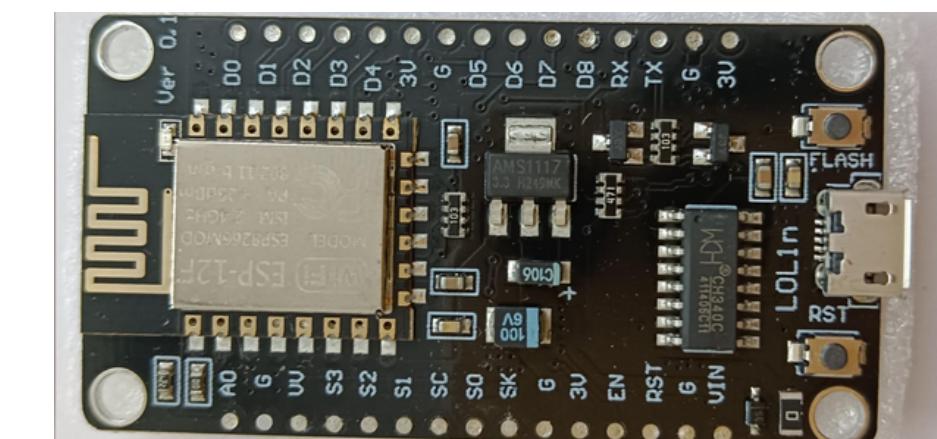
ARDUINO UNO



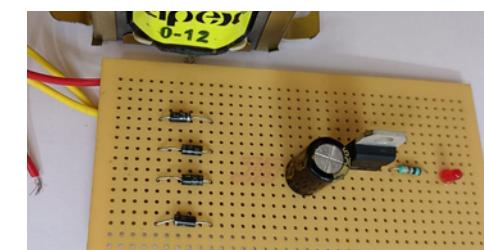
LCD DISPLAY



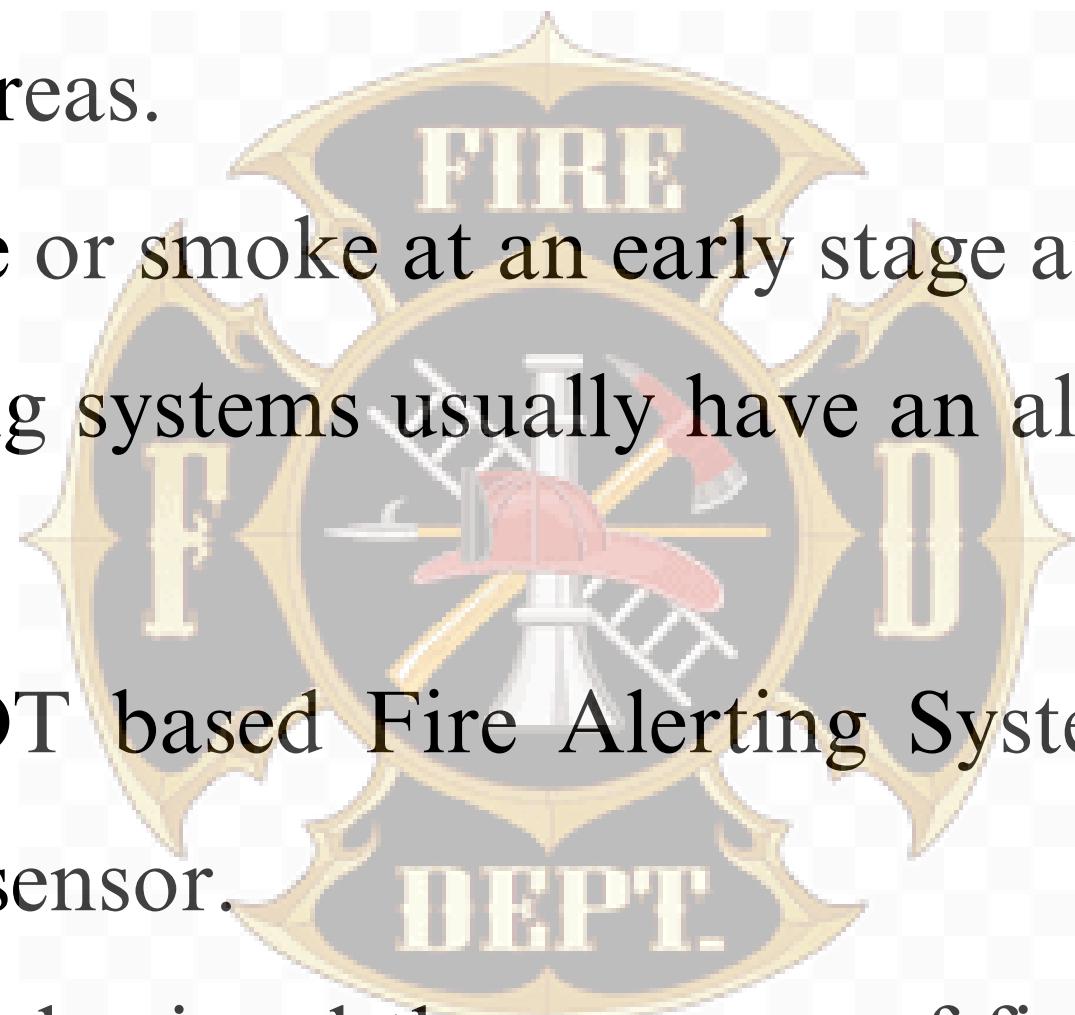
WI-FI MODULE



POWER SUPPLY



- Fire Detectors play a very important role in Industries, Shops, Malls, Residential complexes, and parking areas.
- They help in detecting fire or smoke at an early stage and can help in saving lives.
- Commercial Fire detecting systems usually have an alarm signaling, with the help of a buzzer or Siren.
- We have designed an IOT based Fire Alerting System using a Temperature sensor, flame sensor, and smoke sensor.
- This project would not only signal the presence of fire in a particular premise but will also send related information through IOT.





- The Arduino is programmed to turn on the buzzer when the temperature or flame or smoke reaches threshold value. At the same time, Arduino sends the data to the GSM module. GSM modem is used for connecting microcontrollers to the internet. GSM modem will then send the following data to the IOT website, where, authorized people can take appropriate measures in order to curb the fire.
- Temperature (in Degrees Celsius), Smoke Value (in Percentage), Flame status (ON or OFF), Device ID, Date and Time Stamp
- The device ID is the unique ID given to a device, which would help the person get information related to the location, where the fire is detected.
- The Prerequisite for this IoT-based fire alarming system is that the GSM module should be connected to a network. This project is also implemented without the IOT module. In place of the IOT module, we have sent SMS alerts and in this project, an SMS is triggered when the buzzer is turned ON.



RESULT

SENSOR ACCURACY

- Sensors reliably detect fire incidents with minimum false alarm
- PIR Sensor have an accuracy of 100% within 8m range, so for every 8m in the area a PIR sensor is placed

RESPONSE TIME

- Swift detection and alert transmission enable rapid emergency response
- Accurate pin pointing of fire locations facilitate quick response



DISCUSSIONS

IMPLICATIONS

- The installed fire alerting system can detect fire quickly and alert occupants so that they can evacuate immediately

LIMITATIONS

- Some false alarms can cause unnecessary disruption to services and businesses



CONCLUSION

- To detect fire and some other fire related issues accurately at the particular point
- This prototype helps us to find the amount of heat in degree celsius and percentage of smoke
- This is a data protected system with Wi-Fi sensor for privacy accessing purposes
- It reduces the false alarms because it accurately shows the value



REFERENCES

- Uckelmann, D., Harrison, M., & Michahelles, F. (2011). An architectural approach towardsthe future internet of things. In *Architecting the internet of things* (pp. 1-24). Springer, Berlin, Heidelberg.
- Al Shereiqi, I. M., & mad Sohail, M. (2020). Smart Fire Alarm System Using IOT. *Journal of Student Research* 9(2).
- Li, T., & Hou, P. (2019, September). Application of NB-IoT in Intelligent Fire Protection System. In *2019 International Conference on Virtual Reality and Intelligent Systems (ICVRIS)* (pp. 203-206). IEEE.
- Jadon, A., Varshney, A., & Ansari, M. S. (2020). Low-complexity high-performance deep learning model for real-time low-cost embedded fire detection systems. *Procedia Computer Science*, 171, 418-426.
- Saeed, F., Paul, A., Rehman, A., Hong, W. H., & Seo, H. (2018). IoT-based intelligent modeling of smart home environment for fire prevention and safety. *Journal of Sensor and Actuator Networks*, 7(1), 11



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