



A Review: IOT Based Fire Alert System

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Abstract:

Safety is one of the important factors that should be considered either in the parking area, workplace, home area and so forth. In the university parking area, the students are unable to receive any information regarding a fire smoke or an accident near their vehicle. In addition, the parking safety also not assured due to the shortage of car superintendence and there is no any strict parking management by the security officer. Therefore, a fire smoke alert monitoring system in the university parking area is necessary in order to prevent any accidents that may cause property breakdown and loss of life as happens inside the university area. This system should be introduced since the existing parking is unsystematic and less efficient as it unable to response the complications that are regularly happen to the students because they do not receive any information regarding a fire smoke or an accident near their vehicle in the parking area. With this new system, a few advancements are implemented in order to help the students in various aspects by using multiple and distinct Arduino device.

Keywords: Safety, IOT, Fire.

I. Introduction

Fire can become a very serious threat to human life and property safety. In such situations detecting the fire smoke in advance and alerting emergency's situation quickly would reduce losses of property and life. An IOT based Fire Alert System has the benefit of monitoring the area from distant location and taking immediate action based on message received compared to manual system. The main source of fire in residents is due to burning





of materials, flammable gases, electric circuits, etc. There is no such low-cost fire alert systems or automation available at the homes to provide emergency alerts to the people. fire alert system based on Internet of Things for STEM educational purposes is proposed to create awareness among users regarding fire emergencies in their threshold despite the user's absence. It is deployed onto an IoT platform, where users could monitor their safety and receive images of fire emergency in their corresponding room via Line. Developing such system became feasible with the emergence of internet of things (IoT) paradigms. In fact, IoT, used extensively in many fields, permits the interaction between the virtual and physical world through allowing "Things" to connect to the internet. Through using IoT sensors, we propose a complete low-cost design and implementation of a smart system that enables monitoring and collecting data (temperature, humidity, smoke, number of people in the fireplace) in real time. Our proposed system allows user to monitor the building's status remotely via a friendly dashboard that provides the data of all the parameters in a single page. Whenever a collected parameter crosses its threshold, a buzzer, a red light, and a message sent to the mobile phone alerts the homeowner. So that, he can immediately contact the authority or firefighters to come instantly. One significant advantage of our system is that it counts the number of people present in the fire scene, which will facilitate the evacuation process. Our system has been successfully tested under different scenarios and as a future work we can suggest adding image processing scheme by adding a camera and analyzing real time data collected from sensors using Artificial Intelligence techniques such system became feasible with the emergence of internet of things (IoT) paradigms. In fact, IoT, used extensively in many fields, permits the interaction between the virtual and physical world through allowing "Things" to connect to the internet.

II. Main Components

- Node-MCU:- Node MCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications.
- Flame Sensor:- A flame-sensor is one kind of detector which is mainly designed for detecting as well as responding to the occurrence of a fire or flame.
- 12v DC Fan:- It is an electronic appliance used to flow the air around its environment.
- Power supply, connecting wires: - For providing electricity for above devices.
- 5V Relay:- This is a LOW Level 5V 2-channel relay interface board, and each channel needs a 15-20mA driver current.





III. Related Work

Fire is very deadly and it leads to loss of human life and property. Fire detection systems are necessary to reduce the destruction of personal belongings and caused by fire both man made and induced. The National Crime Records Bureau indicates that there have been a total of 113961 fatalities due to fire accidents during the years 2010 to 2014. Fire accidents claim roughly 65 victims every day.

A total of 1.21 lakh fire accidents occurred between the years 2010 and 2014. Thankfully by the usage of more smart fire detecting systems the number of fire accidents have been reducing steadily. One of the most destructive properties of fire is that it spreads exponentially and with the right medium can spread uncontrollably.

IoT devices have increased 31% per and was at 8.4 billion in the year 2017. The total count is set to reach 30 billion devices by the year 2020. The market value for IoT devices is also set to increase to \$7.1 million by the year 2020. IOT involves connecting objects beyond the range of standard devices which are used for everyday purposes.

The Internet of Things (IoT) is basically the network of ‘things’ by which physical things can exchange data with the help of sensors, electronics, software, and connectivity. These systems do not require any human interaction. In this Arduino fire alarm system using temperature and smoke sensors using the IOT project, we can send LIVE information like Temperature, Smoke Value detected by a particular device to the Fire Department.

IV. Benefits of IOT

As it empowers instruments which can be used by direction of remote over the web, in this way it made opportunities to direct interface and organize the physical world to the PC based systems using sensors and web. Connection of the different introduced contraptions will result in robotization in pretty much, moreover enabling pushed applications. It has helped in achieving better precision, viability and money related preferred standpoint with decreased human intervention. It wraps developments, for instance, sagacious structures, astute homes, shrewd transportation and splendid urban networks.

- Enhanced Customer Commitment, Particular Optimization.
- They help in detecting fire or smoke at an early stage and can help in saving lives.
- Provide real-time electrical feedback.
- Simple circuit setup





V. Conclusion

In this article, a number of selected articles have been covered in the literature review, concentrating primarily on types IOT projects in the recent time. From the above study, due to the range of methods and approaches used to build a Fire Alert System Based on Internet Of things (IOT), it can be said that the growth and advancement of Fire Alert System design is not increasing at a predictable pace. In general, limited to unique applications. By developing more robust knowledge bases, general-purpose Fire Alert System need improvements.

Furthermore, Fire Alert System needs to be developed by extending the data and more features for helping the automating task in the universities, then by directing towards the open domain Fire Alert System, for more extensive implementation in deep learning Fire Alert System Based on IOT. Also, the needs for implementing Fire Alert System within no limitations and more customizable.

References

- [1] Satvik Dasari, Cerberus: A Novel Alerting System for Flood, Fire, and Air Quality 2020 IEEE Eurasia Conference on IOT, Communication and Engineering (ECICE).
- [2] Souad Kamel Mekni, Design and Implementation of a Smart fire detection and monitoring system based on IOT 2022.
- [3] S Srividhya, Suresh Sankaranarayanan, IOT–Fog Enabled Framework for Forest Fire Management System.
- [4] B Prabha, An IOT Based Efficient Fire Supervision Monitoring and Alerting System 2019 Third International conference on I-SMAC.
- [5] Avita Katal, Kavin Sharma and Vitesh Sethi, IOT based Safety System: LPG/CNG Detection and Alert 2021 International Conference on Intelligent Technologies (CONIT).
- [6] Anis Farihan Mat Raffei, Nur Syafiqah Awang, Nur Shamsiah Abdul Rahman, Nor Saradatul Akmar Zulkifli, Internet of Things (IoT) Based Fire Alert Monitoring System for Car Parking 2020 7th International Conference on Electrical and Electronics Engineering.
- [7] Anusha Devi Rajkumar, Sirirat Sakaew, Thammaphon Yensook, Narong Aphiratsakun, Fire Alert System & Application Based on Internet of Things for STEM Education 2020 5th International STEM Education Conference (iSTEM-Ed).
- [8] Sreenivas Eeshwaroju, Praveena Jakkula, Subramanian Ganesan Rakshak – An IoT based application to address safety concerns of an Individual, Group and an Entity 2020 International Conference on Computing and Information Technology (ICCIT-1441).
- [9] Ravi Kishore Kodali, Subbachary Yerroju, IOT based smart emergency response system for fire hazards 2017 3rd International Conference on Applied and Theoretical Computing and Communication Technology (iCATccT).





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