Developed Intelligent Fire alarm system.
[Hussam Elbehiery. J Am Sci 2012;8(8):1016-1024].

The primary purpose of fire alarm system is to provide an early warning of fire so that people can be evacuated & immediate action can be taken to stop or eliminate of the fire effect as soon as possible. Alarm can be triggered by using detectors or by manual call point (Remotely). To alert/evacuate the occupants siren are used. With the Intelligent Building of the rapid development of technology applications, commercial fire alarm market demand growth, the key is to use the bus system intelligent distributed computer system fire alarm system, although installation in the system much easier than in the past, but still cannot meet the modern needs, the installation costs of equipment costs about 33% ~ 70. The suggested technique in Fire alarm system used the addressable detectors units besides using the wireless connection between the detector in zones as a slave units and the main control unit
as the master unit. The system shall include a control panel, alarm initiating devices, notification appliances, and the accessory equipment necessary for a complete functioning fire alarm system. In the wireless fire alarm, individual units are powered by primary & secondary batteries for the communication.

Research on Fire Alarm Computer Monitoring System in Fire Engineering
Xiyang Feng and Chaofei Wang 2021 J. Phys.: Conf. Ser. **1915** 042061

With the in-depth development and application of computer technology, the fire alarm computer monitoring system in fire protection engineering has become more and more essential equipment in modern life. With the support of network technology, the fire alarm monitoring system of fire protection engineering has formed a complete system, including alarm monitoring, automatic fire control, fire linkage control, and fire data monitoring and analysis modules. This article mainly analyzes the fire alarm computer monitoring system in fire engineering.

Hamood Alqourabah,Amgad Muneer,Suliman Mohamed Fati in the paper titled"**A Smart Fire Detrection using IoT Technology with Automatic Water Sprinkler**", which employs different integrated detectors, such as heat, smoke, and flame. The signals from those detectors go through the system algorithm to check the fire's potentiality and then broadcast the predicted result to various parties using GSM modem associated with the system. To get real-life data without putting human lives in danger, an IoT technology has been implemented to provide the fire department with the necessary data. Finally, the main feature of the proposed system is to minimize false alarms, which, in turn, makes this system more reliable. The experimental results showed the superiority of our model in terms of affordability, effectiveness, and responsiveness as the system uses the Ubidots platform, which makes the data exchange faster and reliable.

Poonam Sonsale, Rutika Gawas, Siddhi Pise, Anuj Kaldate in the paper" **Intelligent Fire Extinguisher System**"which proposes an adaptive fusion algorithm for fire detection,and uses a smoke sensor, flame sensor, and temperature sensor to detect fire incident. In reality, the phenomenon of the fire incident may have smoke, flame, and high temperature situations. However, these signals may happen simultaneously or sequentially. We develop an intelligent multi sensor based security system that contains a fire fighting system in our daily life. The security system can detect abnormal and dangerous situation and notify us. First, we design a firefighting system with extinguisher for the intelligent building. We design the fire detection system using sensors in the fire fighting system, and program the fire detection and fighting procedure using sensor based method. Finally, we implement the fire detection system using fire fighting system.

GPS-based fire detection system (Global Positioning System) and SMS Gateway
A Aryanti, I Mekongga and R S Dewi et al 2021 IOP Conf. Ser.: Mater. Sci. Eng. **1108** 012023

This research aims to produce a GPS-based fire detection system (Global Positioning System) and SMS Gateway. The benefits of this detection system can detect early fire occurrence based on the detection of temperature conditions by accommodating the nature of the fire and able to detect any rise in temperature caused by the existence of the fire. This detection system must also be able to read any smoke produced by a fire. To realize the system, required sensors capable of reading the temperature and smoke. The Arduino Uno microcontroller is the brain control system of the system. At a temperature of> 35 C, the system will activate the DHT 11 and MQ 2 sensors that detect smoke> 50 ppm from fire. The system will activate Buzzer as a warning in the form of the next alarm sound Global Positioning System (GPS) will provide information in the form of coordinates of the location of the point of fire through GSM SIM900 Module Short Message Service (SMS) to the user. The results obtained mq2 = 128 ppm and temperature value = 38 ° C and GPS data with latitude of -3.04798388 and a longitude of 104.78263092. From the data it is seen that the mq2 value reaches> 50ppm and the temperature value reaches> 35 ° C, and the detector outputs buzzer sound and warning notification of coordinate point in the form of SMS containing the message "FIRE available" with the coordinates of the location of the fire detected by GPS.

IoT Based Fire Detection System Using Machine Intelligence
4 authors, including Arun Rajesh DOI: 10.13140/RG.2.2.18979.99365

Fire alarms play an important role in residential safety work. While the Fire Services are the first line of defence against fire accidents, they are heavily under-resourced and lack adequate manpower. After analysing the needs of the Indian Fire Department, this paper proposed a IoT-architecture based fire alarm system that alerts the owner and fire station of a fire outbreak. This paper also uncovers the ideal conditions to set off the fire alarm based on the temperature, humidity and the nature of gases present in the environment using the decision tree algorithm. Several cases are recorded for experimentation and training. Results show 91.15% accuracy in detecting fire.

IOT Based Fire Detection System

Rashmi Vinod Patil1, Sayali Fakira Jadhav, Kaveri Sitaram Kapse, Prof. M. B. Thombare, Prof. S. A. Talekar Article · July 2021 DOI: 10.48175/IJARSCT-1681

Fire Detection Systems are now widely used in various safety and security applications. The major amount of fire starts due to the electric short circuit. It leads to damage to property and also loss of life. To avoid that or to minimize the damage caused by fire outbreaks due to electric short circuits an IoT technology is used to control such a kind of risk. Traditional fire detection systems are not that effective and quick to alert the owner about fire, in case no one is present on the location. To overcome this problem in this paper we present the design and development of IoT based Fire Detection System. A system that combines qualities for fire, temperature and smoke detection, sending alert Text Message about the fire to the user along with onsite alarm(buzzer), updating temperature, humidity and smoke on ThingSpeak cloud every 15 seconds, and it also moves manually with the help of Android Application.
The Fire Detection System consists of four main parts: Multiple sensors, communication system (Bluetooth, GSM, NodeMCU), motion planning (Manual patrolling), and Android application for manual patrolling of the system. This Fire Detection system can be used in college, school, office, and industry for safety purposes.

GSM based smart fire and high-temperature detection system

Ravindra Koggalage, Manjula Welihindaand Hasitha Nuwan

Article in ITEGAM- Journal of Engineering and Technology for Industrial Applications (ITEGAM-JETIA) · January 2021

This research refers to an Arduino and Global System for Mobile (GSM) based system for efficient detection of fire hazards. This project's purpose is industrial and domestic safety, and the primary concern is to avoid the fire hazards that occur to the employees and the properties inside the buildings. As a solution, a smart fire and high-temperature detection system is design

using GSM technology, smoke/temperature sensors, and Arduino technology. A smoke sensor is used to detect the smoke from the fire and a temperature sensor is used to detect temperature increase inside the building. In event of a fire, an alert message will be sent to the user via short message service (SMS) via the GSM module. Furthermore, when a fire is detected, a signal will be sent to the main power supply circuit breaker via a microcontroller and then the power supply of the particular building will shut down. Results from the test are documented and discussed in this paper. This system helps users to respond immediately to the situation and so improve their safety by protecting their lives and the properties from a disaster.

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