

- LITERATURE SURVEY

Industry-specific intelligent fire management system

ABSTRACT:

In the recent past, a few fire warning and alarm systems have been presented based on a combination of a smoke sensor and an alarm device to design a life-safety system. However, such fire alarm systems are sometimes error-prone and can react to non-actual indicators of fire presence classified as false warnings. There is a need for high-quality and intelligent fire alarm systems that use multiple sensor values (such as a signal from a flame detector, humidity, heat, and smoke sensors, etc.) to detect true incidents of fire.

The novel idea proposed is to use ANFIS for the identification of a true fire incident by using change rate of smoke, the change rate of temperature, and humidity in the presence of fire. The model consists of sensors to collect vital data from sensor nodes where Fuzzy logic converts the raw data in a linguistic variable which is trained in ANFIS to get the probability of fire occurrence.

The proposed idea also generates alerts with a message sent directly to the user's smartphone. Our system uses small size, cost-effective sensors and ensures that this solution is reproducible. MATLAB-based simulation is used for the experiments and the results show a satisfactory output.

INTRODUCTION:

Fire and smoke kill more people every year than many other forces. While controlled fire serves us in so many instances, uncontrolled fire can be of harm, however, the rapid detection of fire and its control can save lives and property damage worth millions. Conventional and addressable are two main types of fire alarm systems, but unfortunately, these fire alarm systems often generate false alarms. The ratio of false alarm is higher in conventional alarm systems compared to addressable, but addressable alarm fire systems are more expensive. The most likely cause of a false warning is different for distinct types of detection systems, such as a smoke sensor often being activated falsely due to an environmental effect. A false alarm can burden the fire brigade and can turn out to be a costly event; so many studies conducted to reduce them. Previous studies proposed different methods such as autonomous firefighting robots, fire alarm systems with notification appliances, and wireless warning systems. Fire alarm systems with notification appliances can be costly because they use visible and audible stimuli to notify residents. The primary objective of this paper is to develop a reproducible and economical solution with minimum false alarms and a system that alerts via GSM (global system for mobile communication).

NEED FOR FIRE MANAGEMENT SYSTEM:

- Fire prevention, preventing unwanted fires such as house fires, forest fires, and industrial fires
- Fire control, preventing unwanted spread of fires
- Fire management, the skilled modulation of a fire for cooking, heating, or smithing purposes
- Fire control system which directs military shooting
- Director of military for artillery direction

LITERATURE REVIEW:

Proposed an intelligent and smart fire warning system for smart buildings. This system not only analyses the fire presence, but also notifies the concerned people for severe fire chances in case of an emergency or critical situation.

This system can be used at the commercial level and results are reproducible.

The use of IoT (internet-of-things) can enhance the system by talking with various other devices and smart systems like sending the message to smart gas meters to stop the supply of gas in critical conditions, etc.

This system is particularly designed for indoors, as the flame sensor is sensitive to sunlight and, secondly, the reading and training data may differ in open areas, but the minor change in training can overcome this problem.

ADVANTAGES:

A wireless system essentially involves mounting the devices to the appropriate locations around a building or room, setting up the actual system and syncing it to WiFi.

Compare this to a wired system, which requires fire alarm installers to connect the system to power supplies and ensure cables are connected properly.

Another great advantage of a wireless fire alarm system is it operates off of a battery.

This frees up a wall outlet and you can feel safe knowing the system will still work in the event of a power outage. And adding a second or subsequent wireless device is easy if you add on to your home or office.

DISADVANTAGES:

The one thing most **fire alarm system inspectors** caution against with wireless systems is having to replace the battery. The system is essentially useless if the batteries aren't charged, since it won't work properly. There is a bit of a burden to homeowners or business owners to always remember to keep the batteries fresh so the system operates properly when you need it most.

A couple other disadvantages fire alarm system inspectors point out is wireless systems have limited range and don't have centralized monitoring. Range can be a problem for large offices or homes, since a weak wireless connection may cause the system to not operate reliably. Wireless fire alarm systems also don't connect directly to the telephone lines, which are linked to the fire departments, so the response to an emergency could be slower as a result.

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