

HALTING FIRE USING SENSOR TECHNOLOGY

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Abstract - Fire accidents are threatening one now a day. An uncontrolled fire can swipe up huge population and causes heavy loss. Developing an effective solution for controlling fire has become a typical task. This project deals with Internet of things which is an interconnection of physical devices embedded with sensors which is capable of collecting and sending data over internet. It provides convenient and impressive way for controlling fire. The initial step for halting fire is to identify the location of incident, then send notifications to the fire station and by using GSM(Global System for Mobile communication) module and also to the mobile devices of the household. This project halting of fire using sensor technology contains sensor for detecting fire, arduino for implementation, Buzzer for alert of fire, and a circuit. The accuracy of the project is determined by the time taken to identify the fire. It is an application project that can be used to protect rural areas from being attacked by fire.

Key Words: Sensors, circuit, GSM, Arduino,buzzer

1. INTRODUCTION

Fire Detectors assume a significant job in Industries, Shops, Malls and so on. Before endeavoring to comprehend fire discovery systems, it is gainful to have a fundamental information ablaze turn of events and conduct. With this data, the job and association of these supplemental fire wellbeing frameworks in the assurance procedure would then be able to be better figured it out. The key burden of manual stations is that they won't work when the structure is empty this gave the possibility of Automatic recognition frameworks. A key part of fire assurance is to distinguish a creating fire crisis in a convenient way, and to caution the structure's tenants and fire crisis organizations. This is the job of fire identification and alert frameworks. First they give a way to recognize a creating fire through programmed strategies and second, they ready structure inhabitants to a fire condition and the need to empty. Another regular capacity is the transmission of a caution warning sign to the local group of fire-fighters or other crisis reaction association. In this project we are using IOT technology which includes sensors for sensing fire, gsm for sending alert message to the client and to local group of fire-fighters. This project can be mainly used in the areas where we observe frequent fire attacks. This saves them from crucial fire attacks.

1.1 LITERATURE REVIEW

Mahgoub, Asma proposed a framework in 2019 that comprises of a few hubs appropriated over the house. Every one of these hubs comprises a microcontroller(ESP8266 nodeMCU) associated with smoke, temperature, dampness, fire, Methane and Carbon Monoxide sensors that ceaselessly sense the general condition to recognize the nearness of the fire. The hubs make their own Wi-Fi organize. These hubs speak with a concentrated hub actualized with a Raspberry Pi microcontroller incorporated with a 4G module.

Khan, Muhammad Noman Aqeel proposed a system in 2019 to alert the remote users when the fire accidents occur. This system can be easily installed at any remote location from where fire can be easily detected by camera. Therefore, sensors are not required for this purpose. The raspberry pi controller forms the camera input and distinguishes fire utilizing heat marks.. By using image processing method, the report is automatically generated and sends to the person immediately after the fire is being detected using Wi-Fi.

Giandi, Oxsy, and Riyanarto Sarno proposed a system in 2018 which comprises a system of fire detection using gas leak concentration to predict the explosion and fire earlier called fire predictor and the fire appearance detector. The fire predictor just show the gas leak concentration and make an alarm rang. The fire detector use fuzzy system to make the fire detector classification. The output simulation system can send the data to MFC, but the MFC reader cannot parse it in real time., 2018.

1.3 FEASIBILITY STUDY

The fire alarm system has three primary purposes

- Detect a fire
- Alert occupants of the fire condition
- Alert the local fire department

Identifying a fire is ordinarily cultivated by introducing fire sensors. Inhabitant notice is cultivated by the establishment of discernible notice apparatuses. The codes require alarm signals be naturally transmitted legitimately to the nearby local group of fire-fighters, or to a focal station observing help that tells the local group of fire-fighters of the crisis. This gives the local group of fire-fighters a sign quickly and permits them the chance to quench the fire before it gets too enormous.

1.4 PROBLEM STATEMENT

Fire accidents have become most common in these days. It is our responsibility to save people from such type of attacks and alert them before the fire spreads. Considering such situations fire detection systems have been invented. There are certain detection systems but they lack in interacting with fire department. This project minimizes such flaws and works effectively.

2. PROPOSED SYSTEM

The principle topic of this undertaking is to ensure the lives of the individuals in a powerful way that is by presenting programmed fire ready framework instead of manual alerts. Automatic fire alarms are helpful even when there is no human to take care of the tragedy. The output of this system is a notification sent to the resident as well as the fire department. This notification is sent through a hardware device called as GSM which is the main device of our entire system.

2.1 IMPLEMENTATION PROCEDURE

The objective of the project is initially the flame sensor detects the fire through photo transistor, the presence of fire is indicated by alarm and immediately after detecting the fire the notification is sent to the resident as well as the fire department through gsm module.

Components Required:

- Arduino Board
 - GSM
 - Arduino IDE(software)
 - Flame sensor
 - Buzzer
- Steps for construction:

Step1: connect flame sensor to the arduino and check the working of flame sensor with a sample code, observe whether the light on the flame sensor is glowing, that indicates flame sensor is in working condition.

Step2: check whether the GSM is in working condition using the similar process, make sure that sim is inserted properly in the GSM sim slot and signal is appropriate.

Step3: After checking both GSM and flame sensor connect buzzer to arduino accordingly.

Buzzer→Arduino

GND→GND

+Pin→Pin 5

Step4: connect GSM to Arduino

GSM →ARDUINO :

GND→GND

Tx→ pin 7

Rx→ pin 8

Step5: connect flame sensor to sduino

Flame sensor →Arduino

GND→GND

DO→Pin 4

VCC→5V

The flame sensor, buzzer are connected to arduino. When the flame sensor senses the fire then automatically the buzzer is activated to make the people alert in that house. Immediately the gsm which is connected to arduino board will send notification to the owner of the house as well as to the fire department. For the GSM to send the notifications, a sim card is inserted into the GSM sim slot and Arduino IDE in which coding part is implemented for indicating that the notification is sent to the owner as well as to the fire department. The connection between the GSM and the Aduino IDE is done through the arduino which is connected via a type-B USB Cable. To identify the result whether the notification is sent or not is observed in the serial monitor of Arduino IDE.

2.2 BLOCK DIAGRAM

A block diagram represents the entire process visually. It is a graph of a framework wherein the chief parts are spoken to by squares associated by lines that shows connections.

Below diagram indicates the fire is sensed initially using fire sensor thus it undergoes a sensing stage and activate the buzzer, later the input is passed to the arduino, arduino takes input from sensor and activates GSM to send notification, the activation process is done through coding by connecting arduino to the laptop using USB cable.

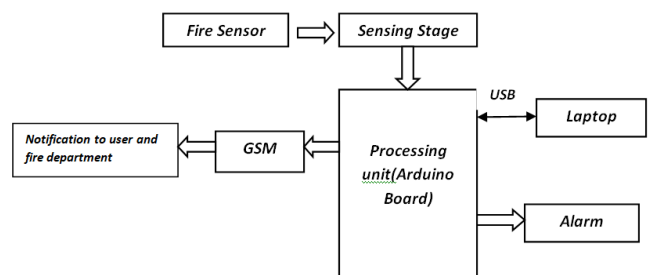


Fig.1 Block diagram of overall system

3. RESULTS

The outcome of this project is pretty simple and effective. The results include detection of fire using flame sensor and send notifications to the owner as well as the fire department to prevent huge losses and halting with in less time

4. CONCLUSION

There are many projects related to fire, in our case we devised a system which detects the presence of fire and alerts the users and fire department during a fire accident. This project helped us in understanding different problems that can be faced while working from scratch, such as working with GSM multiple number of times heats the device and may fuse out, we also learnt that there should not be excessive power supply to GSM and Arduino. Rectifying the errors that are caused in previous system this device can be used efficiently and effectively

FUTURE SCOPE

In this project we focused on and alerting. This can further be extended using sprinklers immediately after fire detection or we can also determine the speed of transmission and estimate the distance till where the fire can transmit and taking action only till the required area. We look forward for further improvements so that it can help many people from saving their lives.

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