



FIRE ALARM NAVIGATION SYSTEM-IOT

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Abstract: In Fire alarm systems are becoming more sophisticated, capable and reliable. Life and property insurance are the two main purposes. Over the past two decades, firefighting has become more focused on life safety due to state and local regulations. Various safety measures have been introduced to solve the problems caused by fires and reduce loss of life and property. Our project aims to create and evaluate an IoT based fire alarm navigation system and application. The purpose of fire alarm systems is to warn people of impending fires so they can get out of the area and act quickly to extinguish the fire. There is a GSM module, a GPS module, buzzers, LEDs and flame detectors for quick communication between the authorities and the fire station. The goal is to reduce property and lives.

Keywords: Fire alarm, IoT, Safety, Modules.

I. INTRODUCTION

Forests are an important part of the world's environment, which also balances the ecological system. A fire is usually discovered after a large area has been covered and then it is sometimes almost impossible to control it. Consequently, other consequences of forest fires include long-term destructive effects that directly affect local weather conditions, warming, and the extinction of rare plant and animal species. Perfect forests are full of flammable objects, such as dry leaves and branches of several trees, which act as a fuel source for fire ignition and subsequent fire stages. Most forest fires are caused by air temperature and occasional humidity, which create a favorable environment for fires to start. These forests and the biodiversity of India increase the likelihood of fires under enormous pressure. It is important to detect forest fires early by taking precautions. To address these issues, we used optimized methods in this proposed framework. The temperature sensor and the fire sensor are placed at a certain distance so that the entire forest area can be observed to detect the alarm temperature and carbon dioxide (CO₂) ignition area. These sensors send a signal or information to the microcontroller. All of them detect changes in the environment and react automatically in an emergency. We have some advantages here, quick response, one-time installation, and the environment of workers can be checked at any time criminals.

II. LITERATURE REVIEW

There have been several researchers who have presented their solutions. Here are some highlights. Many studies have been conducted on systems for delivering fire information, including those that use microcontrollers and mobile phones to deliver the information. As part of this system, MQ-2 smoke sensors are used, UVTRON fire sensors are used, a mobile phone represents a sender of information, and an ATmega32 microcontroller represents a controller. SMS is used to notify users of fires using the SIM900, MQ-2 smoke sensors, and the LM35 temperature sensor. The system can warn the homeowner if a fire occurs outside of the house. Arduino UNO is used to control all the components [1]. An internet of things network is a system that gathers, transfers, and stores data using programmable software, sensors, electronics, and communication facilities. The system is designed to notify and alert a remote fire station and user/owner when a fire accident occurs [3]. In this paper, the former, we designed and evaluated a system. If the temperature exceeds 35 degrees Celsius, the system will activate the temperature DHT 11 sensor due to a fire, as input. Upon hearing a buzzer, the Global Positioning System (GPS) will send a text message to the GSM module of the fire head station informing it of its location [4]. An advanced system for Forest Fire Detection was developed which overcomes the demerits of the Existing technologies of Forest Fire Detection. Remote sensor one of the methods for early woods fire location. For future research, the proposed system can be improved, for example by integrating a surveillance camera for a more precise monitoring process and detection. This system can also be implemented in places where rare wild lives are living and precious trees are planted and to prevent forest fires [5]. Through combustion, flammable materials chemically react with oxygen to cause fires. A fire will be more likely to ignite with a high oxygen concentration. Historically, fire disasters have been most prevalent in densely populated areas. In the event of a fire, high temperature being detected by the sensor, it requests the GPS module by first receiving coordinates of the location where it is located, and then routing it through the Arduino. Afterward, the fire alert message and the corresponding co-ordinates are sent to the fire station [6]. An Microcontroller based house fire alarm system using a GSM Module is described in this paper. The project's primary goal is to keep residents and their belongings safe from fires, which are a common



hazard in residential areas. It uses an Arduino Uno board and an ATmega328 microcontroller. The ATmega328 is the primary controller for the temperature-triggered fire alarm in the average home. The fire's heat is detected by an LM35 temperature sensor. The GSM module will use SMS to send an alarm to the user's mobile phone. A warning message will appear on the LCD display and an SMS alert will be sent to the user's phone when the temperature rises above 400C [7].

III. METHODOLOGY

A. RECEIVING DATA THROUGH TEMPERATURE SENSOR

Generally, temperature will increase and decrease everywhere in the world. In forest area can't overcome in general manner so we are using technology by using sensors are going to overcome it. Whenever temperature gets increase by using LCD it can easily come know about the condition of temperature. Once it gets increased and if it cross its range then automatically buzzer will alert the nearby authority and message will be sent to the registered mobile number.

B. RECEIVING DATA THROUGH FLAME SENSOR

Along with temperature sensor here, I'm going to use flame sensor to eradicate the Sun light or fire which will cause major problems to forest and wild life. As same as temperature sensor, if flame gets increased buzzer starts intimating use that something is going to happen in that particular area along with that nearby authority will get message as flame is getting increased.

C. DATA PROCESSING

After getting data from sensors and modules which is processed by arduino uno. The circuit having an LCD display which will screen the readings of sensors for continuous 24/7 monitoring.

D. TRANSMITTING DATA

Processed data is sent to GSM module which is connected to the arduino for sending alert message to the mobile phone of the user in the event of fire occurs.

E. OUTPUT

Mobile [phone receives a message when the circuit is turned ON. When the temperature rises < 35 degree Celsius which is noticed through DHT11 sensor with flame sensor getting signal by fire which will automatically trigger the buzzer at the same time alert message is sent to user's mobile phone. This makes them to take action against fire to save environment.

IV. PROPOSED SYSTEM

This project highlights the influential feature of wireless sensor networks (WSN) as a probable solution to the challenge of earlier identification of forest fires. The device presented utilizes various sensors attached and data transmission through wireless medium, to fulfill the activity. These gathered data are sent to the small satellite which transmits them to ground station and they are analyzed. The proposed scheme depending on wireless sensor networks (WSN) help in earlier detection of any fire threat. Temperature sensor and fire sensor are deployed at certain distances so that the whole forest area can be kept inside the view in order to detect the ignition alarming temperature and the carbon dioxide gas (CO₂) level. These sensors will send the signal or the information to the microcontroller. These will all sense changes in the environment and react automatically in the event of an emergency. We have some advantages here, Fast response, one time installation, and the workers environment can be monitored anytime.

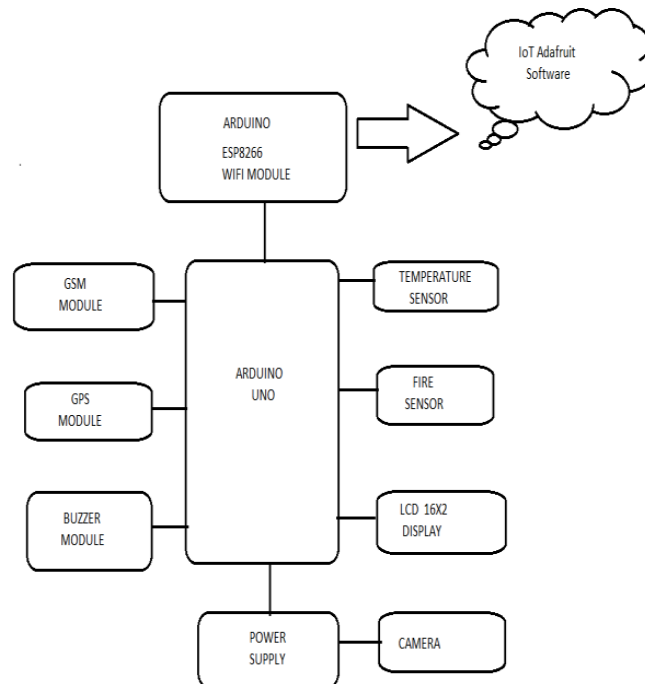
A. Advantages of proposed system

- The proposed system detects the forest fire at a faster rate compared to existing system.
- It has enhanced data collection feature.
- The major aspect is that it reduces false alarm and also has accuracy due to various sensors present.



- It minimizes the human effort as it works automatically.
- This is very affordable due to which can be easily accessed.
- The main objective of our project is to receive an alert message through an mob to the respective user.

B. System Architecture



V. RESULTS

The proposed system is developed using Embedded

C. By efficiently constructing the fire alarm can take rescue action as soon as possible to protect forest ecosystem.

VI. CONCLUSIONS

Early warning and rapid response to fires are the most important strategies to prevent emergencies, natural disasters and social damage. Therefore, the main purpose of flame detection is to quickly and accurately detect and prevent fire. If the ignition source is known and the fire is still in its early stages, it is much easier to put it out. Information about the spread of the fire is also very useful in all phases of extinguishing. With the necessary firefighting tools and techniques, firefighting personnel can be directed to focus on firefighting and rapid extinguishment in traditional objects.

Through this technology, our main goal is to reduce countless financial losses and also the loss of human lives. GSM and GPS as well as sensors built into microcontroller modules can detect fires. A text message is sent when a problem is detected. GoogleMaps shows the longitude and latitude of the event and a message sent to the fire station requesting a quick response to the scene.

VII. FUTURE ENHANCEMENTS

We develop our platform by exploring different environments. An additional pump can be added to automatically send water in case of fire. Industrial sensors can also be used for better distance and accuracy. In the future, we planned to cover the entire circuit with renewable energy, and the image quality will be improved with a high-definition camera in the future. In the future, the most important improvement is that users can easily notice the alarm message by stopping the other function of the mobile phone when only the alarm message is used. alarm message is used.



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