



e-ISSN: 2278-8875

p-ISSN: 2320-3765

# International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 13, Issue 4, April 2024

**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA

**Impact Factor: 8.317**

☎ 9940 572 462

☎ 6381 907 438

✉ [ijareeie@gmail.com](mailto:ijareeie@gmail.com)

@ [www.ijareeie.com](http://www.ijareeie.com)



# IoT Based Fire Alarm Intimation and Extinguishing System

**S.Bharanidharan, S.Kishore, H.Mohamed Faheem, Er.D.Rajarajeswari**

UG Final Year Student, Department of Electrical and Electronics Engineering, Krishnasamy College of Engineering and Technology (Affiliated to Anna University)Cuddalore, India

UG Final Year Student, Department of Electrical and Electronics Engineering, Krishnasamy College of Engineering and Technology (Affiliated to Anna University)Cuddalore, India

UG Final Year Student, Department of Electrical and Electronics Engineering, Krishnasamy College of Engineering and Technology (Affiliated to Anna University)Cuddalore, India

Assistant Professor, Department of Electronics and Communication Engineering, Krishnasamy College of Engineering and Technology (Affiliated to Anna University)Cuddalore, India

**ABSTRACT:** The fire accidents cause the serious damage to the life and the property. This is mainly because of the late response from the fire station which mainly includes the time required to communicate the fire station. The main goal of the proposed idea is to communicate accident information or a message in less time and suppress the fire before spreading. In this proposed project, we use the flame sensor, temperature sensor, smoke sensor which detects the flame, fire, smoke and IOT module which is used to deliver the information about the location of the accident place with the help of GPS module which gives the information about the location and a small robot to suppress the spreading fire. Thus the time taken to get the message across to the fire service station and the over spread can be reduced potentially saving lives of the people.

**KEYWORDS:** FIRE INTIMATION, Temperature sensor, Smokesensor, Flame sensor.

## I. INTRODUCTION

Having a fire alarm system is essential ensure the safety of the people's lives and reduce the amount of losses as much as possible. However, most of the homes lacks the fire alarm systems, which might put the residents in danger when a fire breaks out in their home, either in their presence or absence. Even though some residences have a conventional fire alarm system installed in them, these conventional fire alarm system have some limitations especially when it comes to being activated while the owners of the houses are not present or they are asleep and cannot hear the alarm. This paper tackle the mentioned problem by proposing a fire alarm system that can communicate with owner remotely to warn them if there is a fire at their homes.

## II. LITERATURE SURVEY

- 1. THE DESIGN OF A FIRE ALARM WITH ARDINO-BASED SYSTEM BY MEANS OF GSM MODULE.**  
Dr. Aziz Makandar, Mrs. Kanchan Wangi, Miss. Daneshwari Stavarmath on the title “The design of a fire alarm with Arduino- based system by means of GSM Module”. The work purposely for house safety where the main point is to avoid the fire accidents occurred to the residents and the properties inside the house.
- 2. IOT BASED FIRE ALARM SECURITY SYSTEM.**  
Hari Varshini S, Boomika S, Sherene Amalia G, Leena on the title “IOT BASED FIRE ALARM SECURITY SYSTEM”. Fire alarm systems are essential in alerting people before fire engulfs their homes. However, fire alarm systems, today, require a lot of wiring and labor to be installed. This discourages users from installing them in their homes.
- 3. IOT BASED FIRE INTIMATION AND FIREEXTINGUISHER ROBOT.**  
Rahul S, Shashank S, Aniket S, Kamlesh S, Yogesh S on the title “IoT based Fire Intimation and Fire Extinguisher Robot”. A lack of technological innovation has led to many losses in the historically hazardous field of Fire Fighters.



Additionally, the methods used to combat fires today are inefficient and rely too heavily on human beings, who are susceptible to error regardless of level of training.

**4. METHOD FOR FIRE AND SMOKE DETECTION IN MONITORED FOREST AREAS.**

David Asatryan; Samvel Hovsepyan on the title “Method for fire and smoke detection in monitored forest areas”. Forest fire early detection is an important problem from many points of view. It harms ecology and decreases the overall life quality also it is important from economical point of view as wood is a valuable resource.

**III. EXISTING SYSTEM**

In the existing system sensors and GPS module are integrated to the microcontroller. With the help of IOT the message is sent to nearby fire station for ultimate response to extinguish the fire with the help of fire fighters.

**DISADVANTAGES**

- GPS has a positional error of between 5m & 10m globally.
- A lack of technological innovation has led to many losses in the historically hazardous field of Fire Fighters.
- Fire alarm systems, today, require a lot of wiring and labor to be installed. This discourages users from installing them in their homes.

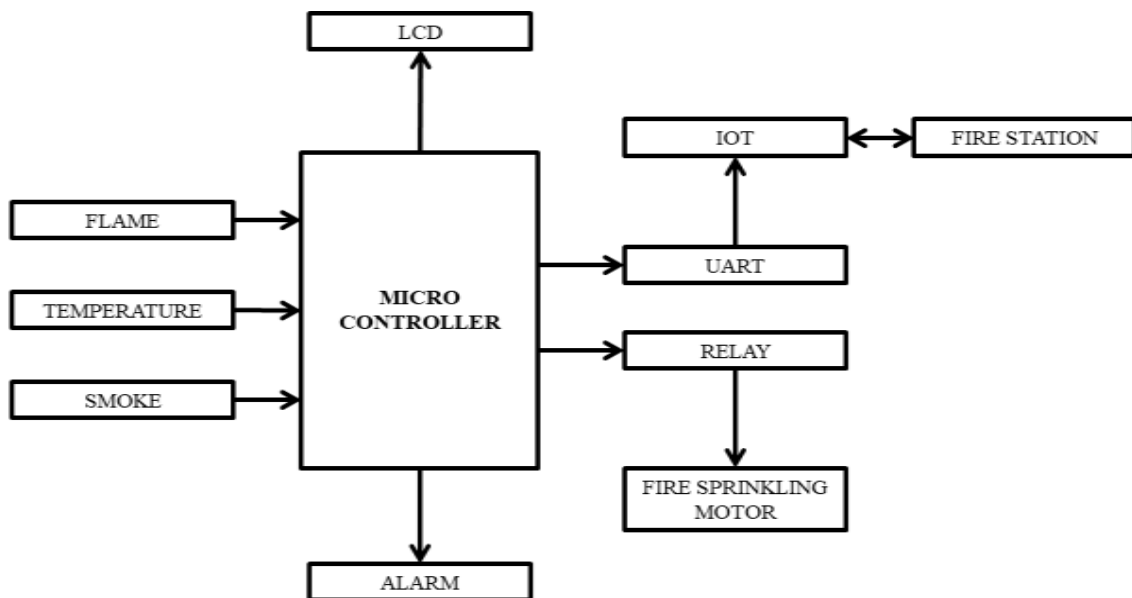
**PROPOSED SYSTEM**

In the existing system sensors and GPS module are integrated to the microcontroller. With the help of IOT the message is sent to nearby fire station for ultimate response to extinguish the fire with the help of fire fighters. With the help of a robot we suppress the fire from overspreading. To suppress the overspreading of fire before the arrival of fire fighters. To save human lives. To minimize property damage.

**ADVANTAGES**

- To reduce the time of communication through IOT as compared to manual intervention.
- To suppress the overspreading of fire before the arrival of firefighters.
- To save human lives. To minimize property damage.
- GPS is very accurate while connected with IoT.

**BLOCK DIAGRAM**



**Fig 1.** Block diagram Receiver Section



#### IV. COMPONENTS

**MICROCONTROLLER:** The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured using Atmel's high-density nonvolatile memory technology and is compatible with the industry-standard 80C51 instruction set and pinout.

**FLAME SENSOR:** LM393 flame sensor is mostly sensitive to flame, and it will also respond to ordinary light, generally used in fire alarm and other purposes. It can be directly connected to the microcontroller IO port. The sensor should be kept a certain distance from the flame, so as not to damage the sensor because of high temperature. The test distance for the lighter flame should be 80cm, the larger the flame, the larger the test distance. Small plates analog output mode and the AD conversion process can help get higher accuracy.

**SMOKE SENSOR:** The MQ-6 module is used in gas leakage detecting equipment in family and industry, This module has high sensitivity to LPG, iso-butane, propane and LNG. It can also be used to detect the presence of alcohol, cooking fumes, and cigarette smoke. The module gives out the concentration of the gases as a analog voltage equivalent to the concentration of the gases. The module also has an onboard comparator for comparing against an adjustable preset value and giving out a digital high or low.

**LCD:** LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs.

**RELAY:** A 12V relay is an electrically operated switch. It consists of a set of input terminals for a single or multiple control signals, and a set of operating contact terminals. The switch may have any number of contacts in multiple contact forms, such as make contacts, break contacts, or combinations thereof.

**SPRINKLER MOTOR:** A sprinkler is a device used to spray water. Sprinklers are used to water plants or grass, or to put out fires in buildings.

**UART:** A universal asynchronous receiver/transmitter is a type of "asynchronous receiver/transmitter", a piece of computer hardware that translates data between parallel and serial forms. UARTs are commonly used in conjunction with other communication standards such as EIA RS-232.

**IOT:** The term IoT, or Internet of Things, refers to the collective network of connected devices and the technology that facilitates communication between devices and the cloud, as well as between the devices themselves.

#### PHOTOGRAPH OF MACHINE

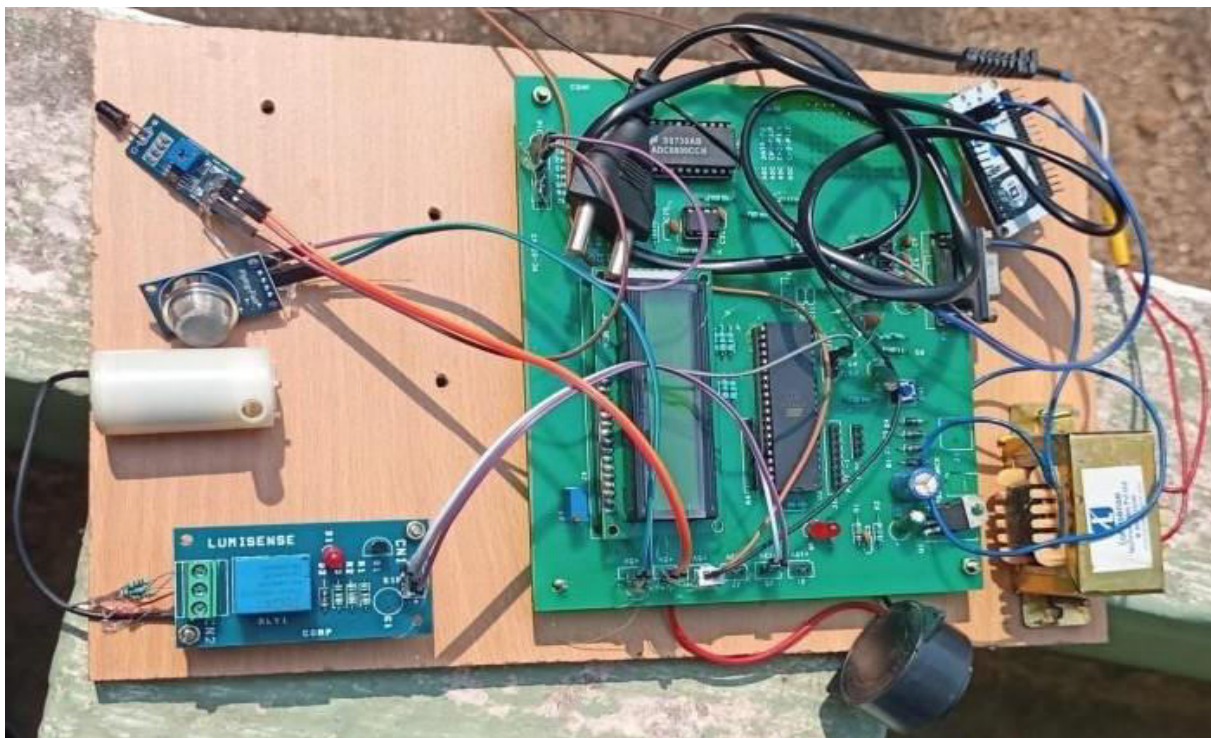


Fig 2. Photograph of Machine



**||Volume 13, Issue 4, April 2024||**

**| DOI:10.15662/IJAREEIE.2024.1304042 |**

## **V. CONCLUSION AND FUTURE SCOPE**

Our primary goal with this system is to reduce the numerous losses in human life and economic losses. With the help of sensors integrated into the microcontroller, it can identify fire. A message is sent via IOT if a problem is detected. A message sent to the fire head station for quick response at the incident location can be viewed on Maps along with the longitude and latitude and to suppress the overspreading of fire before the arrival of fire fighters using a fire sprinklers. We compare the system results with fire head station data of response time, indicating a remarkable difference between manual and system generated call responsetime.

## **REFERENCES**

1. Breejen E. D. et al 2003–2012 In Proceedings of 3rd International Conference on Forest Fire Research and 14th Conference on Fire and Forest Meteorology (Luso, Portugal) Autonomous forest fire detection 16- 20.
2. Hartung C. and Han R. Fire WxNet: A Multi Environments 4th International Conference of Mobile Systems, Applications and Services.
3. Viegas D.X. Fire Behaviour and Fire line Safety Annual Mediterranean Burns Club
4. Scott J. H. Introduction to Wildfire Behaviour Modelling National Interagency Fuels, Fire and Vegetation Technology, Wildland Fire Management RD&A.
5. Alkhatib A. A Review on Forest Fire Detection Techniques International Journal of Distributed Sensor Networks Article ID: 597368.
6. Vicente F. B., Carbajal N., Felipe L. and Martínez L. P. Estimation of Total Yearly CO<sub>2</sub> Emissions by Wildfires in Mexico during the Period 1999-2010 Advances in Meteorology Article ID: 958457.
7. Zhao Y., Zhou Z. and Xu M. 2015 Forest Fire Smoke Video Detection Using Spatiotemporal and Dynamic Texture Features Journal of Electrical and Computer Engineering Article.





INNO  SPACE  
SJIF Scientific Journal Impact Factor



**ISSN** INTERNATIONAL  
STANDARD  
SERIAL  
NUMBER  
INDIA



# International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

 9940 572 462  6381 907 438  [ijareeie@gmail.com](mailto:ijareeie@gmail.com)



[www.ijareeie.com](http://www.ijareeie.com)

Scan to save the contact details