iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 10 **Issue:** V **Month of publication:** May 2022

DOI: https://doi.org/10.22214/ijraset.2022.42674

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue V May 2022- Available at www.ijraset.com

Forest Fire Detection Using Wifi Module and Camera Surveillance

S. Ramya[1], P. Pallavi[2], G. Radhika[3], Mrs. A. Jyothi[4]
[1, 2, 3]*Dept of CSE*
[4]*Asst professor, AGI*

Abstract: ***Forest fires result in extreme damage to the ecosystem and cause serious threats to the environment. The response time of emergency teams greatly affects the consequences and losses caused, so preserving forests and making efforts into improving the existing approaches to stop fires should be our main concern.***
The proposed system detects fire by taking a few natural variables into consideration such as temperature, humidity and smoke. The realtime monitoring of these elements takes us one step closer to our goal, the camera surveillance and Wi-Fi module help us monitor the values of respective variables at an instant to make the system efficient. In case of fire, the temperature sensor, smoke sensor and fire sensor give alert to the system through the Wi-Fi module and the help can immediately reach the affected area and take necessary
steps to make the losses minimum. The camera surveillance helps us analyse the spread of the fire to ensure necessary equipment is being taken and also helps in finding the cause of the fire
Keywords: Wifi module, Camera surveillance, Fire detection, Buzzer, Camera, Mobile application

I. INTRODUCTION

Forest is one of the major wealth of our country. Forests provide enormous goods and environmental services. So, the forest fire must be detected at an earlier stage.
Due to isolation, inaccessibility, tough weather, shortage of frontier staff, the early finding of forest fire is a difficult task. If the fire is widespread then the damage control for saving the forest would not be much effective as forests once on fire take a long time to cool down and eventually stop burning. The traditional way of finding out the forest is on fire through satellite images or changes in atmospheric pressures takes a lot of time and is not a permanent solution.
Instead, we try to find a new approach to tackle this problem.

II. PROBLEM STATEMENT

In today's world where climate change has become a global phenomenon, one must be aware of the repercussions for his actions. Thousands of acres of forests have been turned to ashes just by irresponsible human intervention with nature. If this keeps on going, the carbon dioxide levels will be off the charts and the planet will be at its highest temperature, the polar ice caps will disappear into water and there will be havoc everywhere.
Humans have always turned a blind eye towards the protection of nature, Forest fires are one example. Preventive measures are being taken but they are not enough, the system should update and adapt to the new situations and factors and people must work hand in hand for better results. To bridge the gap between the available system and the sustainable future, the proposed system has taken a step forward into achieving the goal.

III. LITERATURE SURVEY

A. Problems Associated with Traditional Look-Out Stations

Look-Out Stations are situated at a location with extreme visibility and are associated with manned structures whose sole purpose is to locate and report forest fires. These Look-Out stations require a lot of manpower to cover the entire scale of the forest. In case of poor visibility and other dangerous weather conditions these lookout stations do not have the capacity to report any forest fires. These result in wastage of manpower as well as losing a part of forest to create a pathway which leads to the look-out stations. Even with these Look-Out stations, many forest fires still occur, as this is not the perfect solution for solving the forest fire detection problem.

©IJRASET: All Rights are Reserved

B. Need for Improved Solutions

In today's world there exists a need for advancement in the detection of forest fires. These traditional approaches whose sole purpose is to find and report forest fires have failed to give accurate and timely information to stop the forest fires. There exists a need for a new and intuitive approach with the fusion of modern technology. This could potentially help in improving the chances of detecting forest fires at early stages. Further, look-out stations could mistake fog to smog and give false reports but, with advanced technology there exists approaches to intelligently detect forest fires using multiple parameters.

IV. HARDWARE COMPONENTS

A. Smoke Sensor

It is an electric device, which senses the smoke which is the key identification of fire, and gives alarm warning to the people.

B. Temperature Sensor

It measures the amount of heat energy, and allows them to detect the temperature changes and converts the changes to information. The temperature sensor ranges from 95-1260c.

C. Camera

The camera is one of the applications of the early fire detection system for monitoring the forest. It is used for monitoring the forest and also can detect the reason for the fire using the pictures or video.

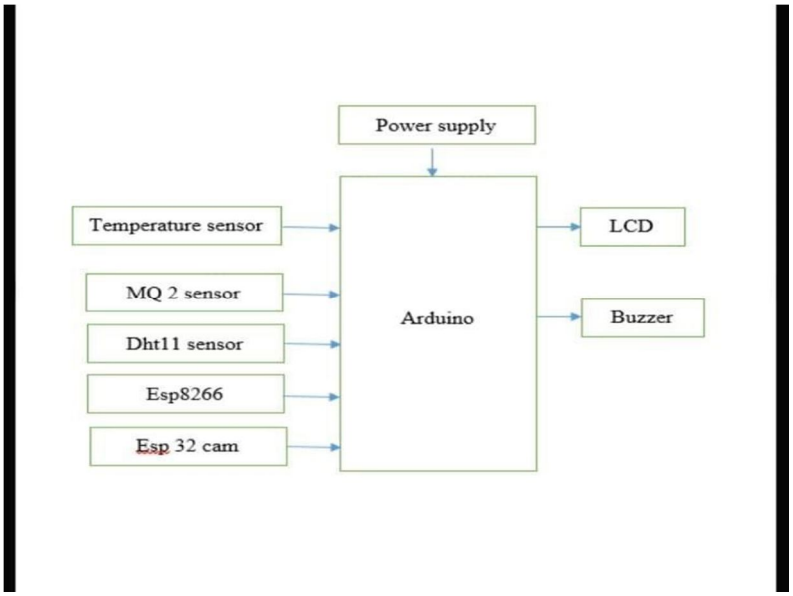
D. Buzzer

Buzzer is an audio signalling device and it is a kind of voice device, it converts into a sound signal. It is widely used in household appliances, low-voltage electrical equipment, alarm systems, game machines, etc.

E. Wi-Fi

Wi-Fi is a family of wireless network protocols, based on the IEEE 802.11 family of standards, which are commonly used for local area networking of devices and Internet access, allowing nearby digital devices to exchange data by radio waves. These are the most widely used computer networks in the world, used
globally in home and small office networks to link desktop and laptop computers, tablet computers, smartphones, smart TVs, printers, and smart speakers together and to a wireless router to connect them to the Internet, and in wireless access points in public places like coffee shops, hotels, libraries and airports to provide the public Internet access for mobile devices.

V. ARCHITECTURE



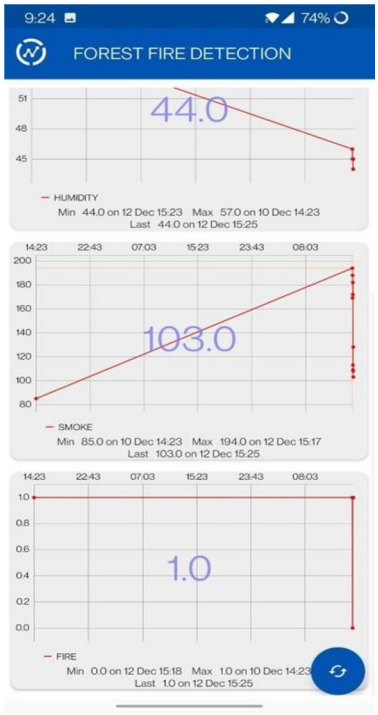
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 10 Issue V May 2022- Available at www.ijraset.com

VI. RESULTS & DESCRIPTION

The proposed system uses temperature sensor, smoke sensor and keeps track of humidity and displays the values on an LED, it uses a Wi-Fi module to update the values in a mobile application to constantly monitor the situation and changes in the environment. The camera provides surveillance of the area and gives better scope of monitoring the premises. In case of a fire, the temperature and smoke
sensor values will spike, and the values are shown in the application. The buzzer will go off as the fire detector will initiate it. A graphical representation of the values will be pictured in the application to notice the patterns. The emergency team is notified with the buzzer and the changes that happen in the application and help can be immediately reached. The temperature and smoke sensor detect the abnormalities that occur in case of fire and the information is updated in the app, the buzzer buzzes and an alert appears in the application. The fire department can monitor the camera footage and analyse the exposure and range of fire and take necessary precautions and stop the fire, the camera surveillance can later be used to find the cause of the fire and punish the guilty.

VII. CONCLUSION

The challenges have increased rapidly since the past two decades. The way these challenges are growing we need solutions that can keep in pace with them. The proposed system helps to detect the fire accident and reduce the damage caused by the fire to the forest and reduce delay in reaching the emergency services to the fire accident location. The system sends an alert message to the emergency services and helps make the losses minimum by helping the environment in a positive way and making the emergency team reach the affected area as soon as possible. These systems are just the beginning of the revolution in safeguarding biodiversity and saving the forests.



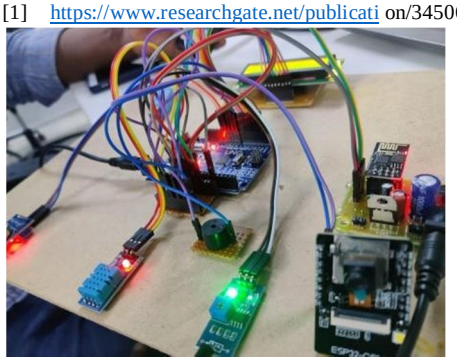
VIII. FUTURE ENHANCEMENT

Cameras are making a huge impact when it comes to detecting and responding to fires. Thanks to intelligent solutions provided by network cameras and intelligent sensors, fire can now be handled in a better way.
From completely revolutionising wildfire detection, to preventing arson in smart
cities, it's clear that these visual sensors have a lot to offer when it comes to fire detection. Specifically, multi sensor cameras can further enable these different use cases from an economic perspective, as one device allows the user to monitor a vast area in 360 degrees more cost-effectively than multiple individual sensors. These types of sensors as universal as the traditional smoke alarm will not only make the world a safer place, it will also play a good role in combating environmental issues and driving us towards a more sustainable future.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

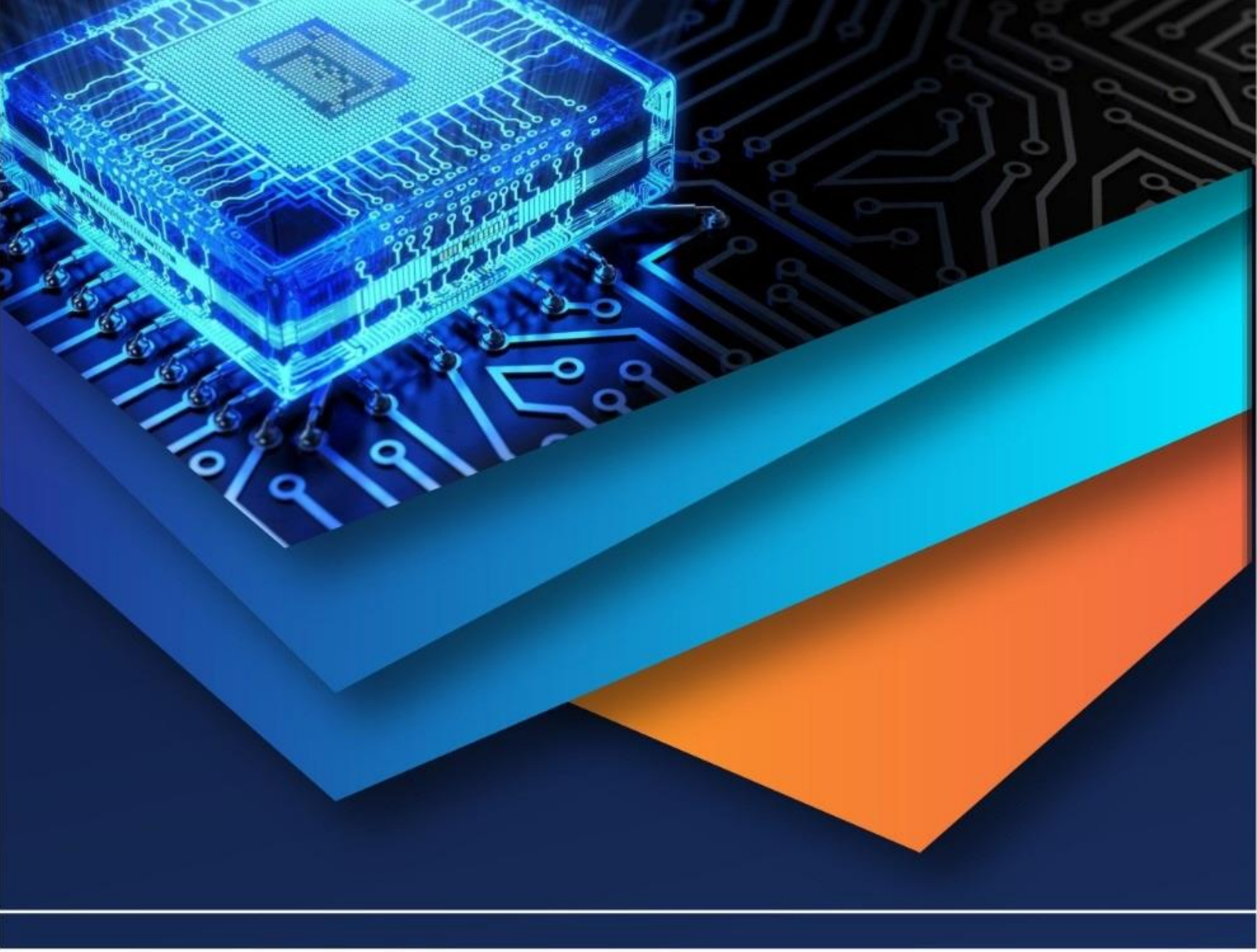
REFERENCES

[1] https://www.researchgate.net/publicati on/345062499_A_Smart_Fire_Detecti on_System_using_IoT_Technology_W ith_Automatic_Water_Sprinkler



[2] https://www.researchgate.net/publicati on/345062499_A_Smart_Fire_Detecti on_System_using_IoT_Technology_With_Automatic_Water_Sprinkler
[3] https://www.researchgate.net/publicati on/324054113_IoT_based_forest_fire_detection_system/link/5ce7c459458515712ebdc6fd/download

.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)