# A System for Saving Wild Animals from the Forest Fire Using Raspberry PI

Jeya Deepika K, Pavithra N, Rajeshwari A

Department of EEE, Dr. K. Karthikeyan, RIT, Tamil Nadu, India

## ABSTRACT

Forest fire causes greater havoc to forest and endangers wild life. In this paper on intelligent early warning fire detection system based on image processing on IoT platform was proposed. A real time flame detection algorithm that differentiates fire and fire colored object is used to detect the true fire incident.Rasperry pi microcontroller based IoT platform detect the forest fire as early as possible and takes speedy action before the fire spreads over large area. Sensors such as smoke sensor are connected with Raspberry pi. IoT (server) connected with Raspberry pi alerts the fire and sprinkler motor spraying the water, then GPS will be sharing the location.

**Keywords:** Raspberry pi 3B+ module,Gas sensor, Thermal camera,IOT(server),GPS module,buzzer,Dc motor, Driver board

## I. INTRODUCTION

Wildfire is an uncontrolled fire which cause sufficient damage to natural and humanresources. Once the hearth starts ignited it rapidly spreads everywhere the forest and leads to massive destruction. Some of the reasons for old fire for lightning,extreme hot and arid weather, severe drought and human unawareness. Over the past decade there is an enormous destruction in forest, in which the majority of those accidents were caused by forest fire. Based on the forestsurvey of India's data on forest fire it started that around 50% of the forest areas as fire prone. Based on theforest inventory records, 54.40% of forest in India are exposed to occasional fires, 7.49% to moderately frequent fire and 2.405 to high incident levels while 35.71% of India's forest haven't yet been 2 exposed to fires of any real significance. Between January 1,2019 and February 26,2019 a count of 558 forest fire accrued in India. These incidents show that forest do not have proper fire prevention system. In this project, we designed an IOT infrastructure for fire detection system to assist detect fire as soon as possible, before the hearth cover the massive area. The system is going to be integrated with several sensors to detect fire and motion. The device is going to be placed on proper places after doing surveys. The data collected by sensors will be send to raspberry pi placed on various places. Then the system will process the info and at that very same time the system will send SMS using GSM module to the nearby fire station with the situation of the fire using GPS module. Several types of sensors used in the system or gas sensor and flame sensor.

## II. METHODOLOGY:

The project consists of two main sections: • Hardware (which entails the physical components of the system) and • Software (which is the encoded computer instruction allowing signal processing to be achieved.
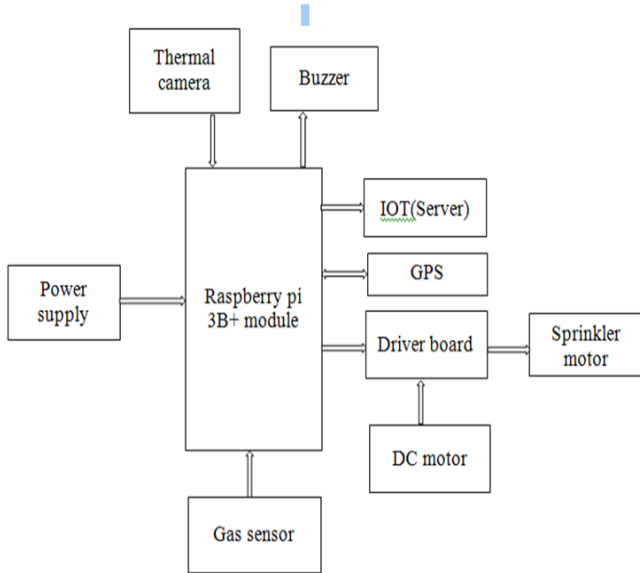


Figure 1. Methodology

The power supply is given to the raspberry pi and raspberry pi will be initiating. If any fire occurs in forest area gas sensor and thermal camera will be detect buzzer is ringing, then IoT (server) will be send to the alert message in the required forest station and GPS will be sharing the location using Blynk app. DC motor and sprinkle motor is connected to the driver board, which is spraying water in the fire.

## III. RESULT & DISCUSSION:

Connect the components as a complete hardware setup. The required power supply is given to the raspberry pi and coding is inserted to raspberry pi. Immediately thermal camera displays the home screen and initializing the coding. If fire occurs, the thermal camera and gas sensor detects the fire and capture the fire image it shows in the display. At the same time, the system alerted by the buzzer. After that, water will be spray to the fired area. Added that

using IOT(server) and GPS send the given message and location of fire occurs in the forest and to be shared the forest station.
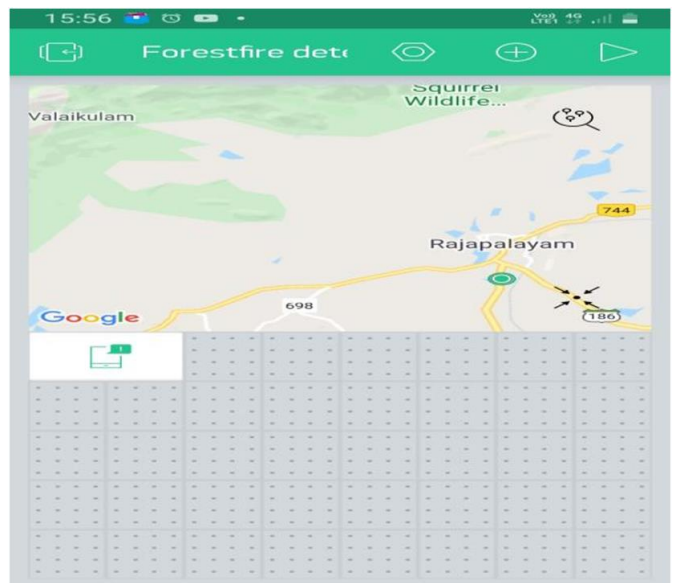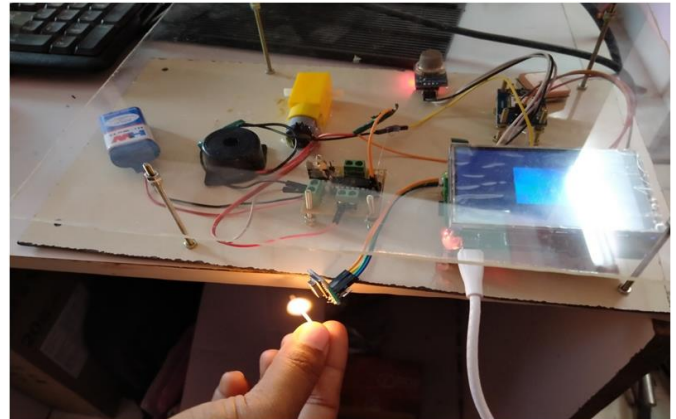
## IV. CONCLUSION

Fire accident cannot be controlled to a great extent in a place such as like a home, forests, hospitals, colleges, industries and some other public places. Fire accidents leads to death of excess people, by using the technique we can save those lives easily. In the forest area fire will be occur many times but not at all control the fire. So many wild life animals are affected this fire. In this project we are developed a system forsaving wild animals from the forest fire using raspberry pi and thermal camera. This system is detection for fire sending the alert message and location will be sharing the nearest forest station, then spraying the water on fire.

## V. REFERENCES

[1]. Prof. Md Saifudaullah Bin Bahrudin, Rosni Abu Kassim, "Development of Fire Alarm System using Raspberry Pi and Arduino Uno", Electrical, Electronics and System Engineering (ICEESE), 2013 International Conference on. IEEE, 2013.

[2]. Yu, Liyang, Neng Wang, and Xiaoqiao Meng, "Real-time forest fire detection with wireless sensor networks," in Proceedings of International Conference on Wireless Communications, Networking and Mobile Computing, Vol. 2, 2005.

[3]. Sowah, Robert, et al., "Design and implementation of a fire detection and control system for automobiles using fuzzy logic," in Proceedings of Industry Applications Society Annual Meeting, 2016.

[4]. Sharma, Amit; Singh, Pradeep Kumar; Kumar, Yugal (2020). "An Integrated Fire Detection System using IoT and Image Processing Technique for Smart Cities", Sustainable Cities and Society. doi: 10.1016/j.scs.2020.102332.

[5]. Celik, T., Demirel, H., 2009. "Fire detection in video sequences using a generic color model", Fire Safety Journal, 44, 147–158. https://doi.org/10.1016/j.firesaf.2008.05.005.

[6]. Y.L. Song, "Discussion on fire characteristics and fire countermeasure of ancient buildings", Fire science and technology, 23 (2004), pp. 396-398.

[7]. J.H. Li, "The Fire Risk Assessment and Fire Prevention Research of Lijiang Historical Buildings", Journal of Chinese People's Armed Police Force Academy, 30 (2014), pp. 57-61.

[8]. S.Y. Jiang, "Fire hazard analysis on typical old temples of JiuHua Mountain", Journal of Safety Science and Technology, 9 (2013), pp. 121-125.

[9]. Arrue, B., Ollero, A., Martínez de Dios, J., "An intelligent system for false alarm reduction in infrared forest-fire detection", IEEE Intell. Syst., 15(3), 64–73 (2000).

[10]. Campbell, D., Born, W.G., Beck, J., Bereska, B., Frederick, K., Hua, S., "Airborne wildfire intelligence system: a decision support tool for wildland fire managers in Alberta", In: Proc. SPIE, Thermosense XXIV, vol. 4710, pp. 159–170 (2002).

[11]. Casbeer, D., Kingston, D., Bear, R., McLain, T., Li, S., "Cooperative forest fire surveillance using a team of small unmanned air vehicles", Int. J. Syst. Sci. 37(6), 351–360 (2006).