



**HOMESHIELD: SMART IOT BASED INTEGRATED HOME SECURITY SYSTEM**

**<sup>1</sup>DR.N.L.ARAVINDA, <sup>2</sup>ADDANKI ASHRITHA, <sup>3</sup>ALUGOJU LAVANYA, <sup>4</sup>BANDI TRIVENI**

<sup>1</sup>Assistant Professor, Department of Electronics and Communication Engineering, Malla Reddy Engineering College For Women, Maisammaguda, Dhulapally Kompally, Medchal Rd, M, Secunderabad, Telangana.

<sup>2,3,4</sup>Student, Department of Electronics and Communication Engineering, Malla Reddy Engineering College For Women, Maisammaguda, Dhulapally Kompally, Medchal Rd, M, Secunderabad, Telangana.

**ABSTRACT**

24/7 smart iot based home security system is developed using different sensors and modules to safeguard the user properties or things under all the situations This system will work for 24/7 whether the user is inside or outside the home This system identifies if there is any gas leakage, fire breakout or for any unknown person entering the house if so our system gets alert and sends messages (sms) to user accordingly system uses raspberry pie camera to record all the events that occur inside the house and these recordings are stored in cloud neither in local because to keep our system cost effective. All the recordings can be seen and downloaded by user whenever he wants to. So we have developed a 24/7 smart iot based home security system.

**I.INTRODUCTION**

As we have been noticing in the recent times that the illegal activities are increased in a huge extent especially robbery and everyone wants to safeguard their goods from all these illegal crime rates hence we made up our mind to develop this system which safeguards the goods and property of the user whether he/she is inside or outside the house. Since the present living situations is very tough for all of us ,we all are forced to get into the high expensive markets for buying security instruments to safeguard the house such as fire or gas alarms. However it simply triggers an alarm and for recordings, videos and pictures we need to separatly buy all the instruments from markets with subject to monthly subscriptions because these are all handled by the security service companies. previous systems implemented either only gas or fire

but our system is an all in one approach with fire, gas and intruder detections.

**II.LITERATURE SURVEY**

**Kumar, R. Praveen, and S. Smys. "A novel report on architecture, protocols and applications in the Internet of Things (IoT)." In 2018 2nd International Conference on Inventive Systems and Control (ICISC), pp. 1156-1161. IEEE, 2018.**

24/7 smart iot based home security system is developed using different sensors and modules to safeguard the user properties or things under all the situations This system will work for 24/7 whether the user is inside or outside the home This system identifies if there is any gas leakage, fire breakout or for any unknown person entering the house if so our system gets alert and sends messages (sms) to user accordingly system uses



raspberry pi camera to record all the events that occur inside the house and these recordings are stored in cloud neither in local because to keep our system cost effective. All the recordings can be seen and downloaded by user whenever he wants to. So we have developed a 24/7 smart iot based home security system. As we have been noticing in the recent times that the illegal activities are increased in a huge extent especially robbery and everyone wants to safeguard their goods from all these illegal crime rates hence we made up our mind to develop this system which safeguards the goods and property of the user whether he/she is inside or outside the house. Since the present living situations is very tough for all of us ,we all are forced to get into the high expensive markets for buying security instruments to safeguard the house such as fire or gas alarms. However it simply triggers an alarm and for recordings, videos and pictures we need to separately buy all the instruments from markets with subject to monthly subscriptions because these are all handled by the security service companies. previous systems implemented either only gas or fire but our system is an all in one approach with fire, gas and intruder detections.

**Md Saifudaullah Bin Bahrudin,  
“Development of Fire Alarm System  
using Raspberry Pi and Arduino Uno” in  
2013 International Conference on  
Electrical, Electronics and System  
Engineering**

The proposed Fire alarm system is a real-time monitoring system that detects the presence of smoke in the air due to fire and captures images via a camera installed inside a room when a fire occurs. The embedded systems used to develop this fire

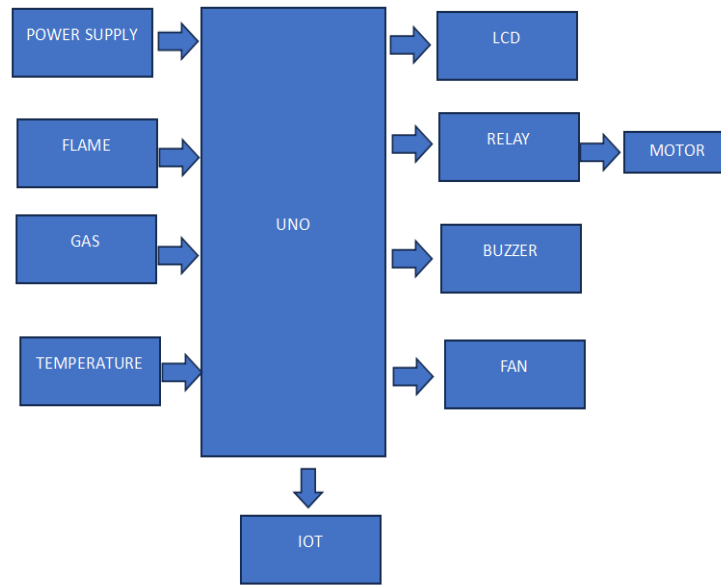
alarm system are Raspberry Pi and Arduino Uno. The key feature of the system is the ability to remotely send an alert when a fire is detected. When the presence of smoke is detected, the system will display an image of the room state in a web page. The system will need the user confirmation to report the event to the Firefighter using Short Message Service (SMS). The advantage of using this system is it will reduce the possibility of false alert reported to the Firefighter. The camera will only capture an image, so this system will consume a little storage and power. Fire is an undesirable event that could bring a great loss of social wealth and human life. To prevent this losses, various alarm systems have been developed such as smoke detectors, temperature sensor based systems etc. As technologies evolved and instruments such as temperature sensors, camera etc becomes affordable, various automated fire alarm systems are now available. In conjunction with the cheaper instruments, internet based and wireless broadband technologies, have also improved and there are now various systems that enables cheap, high rate data transmission and wireless networking. The availability of cheap credit card sized single board computer such as the Raspberry Pi has enabled the creation of numerous automated and monitoring system that has low power consumption, faster processing ability at a lower cost. The fire alarm system proposed in this paper integrates the use of affordable instruments, connectivity and wireless communication. Various research and numerous prototypes of automated security surveillance system have been developed using various platforms. Recent improvements in GSM, web server and micro controller technologies have led to the developments of various fire alarm systems.



For example, Yu Qiongfang et.al [1] proposed an intelligent fire alarm system using fuzzy neural network. It process data from the sensors and calculates model 978-1-4799-3178-1/13/\$31.00 ©2013 IEEE 43 Rosni Abu Kassim Norlida Buniyamin Faculty of Electrical Engineering University Teknologi MARA Selangor, Malaysia of fuzzy neural network based on the characteristics of fire detection signal so it will has a self-learning and adaptive capability. However, it is only a study on proposing a new approach for fire detection. Cao Shunxia et.al [2] designed a wireless intelligent home alarm system consisting on anti-theft feature, anti-fire feature, and anti-harmful gas leak feature using Single Chip Microcomputer (SCM) AT89C51 and voice chip ISDI420. Two SCMs were used to display the gas concentration and alarm host as the alarm signals were sent by using wireless transmission. When the sensor detects smoke, a voice message will be sent to the relevant department. However, if an error occurs during the detection, a false alarm will be submitted because this system did not include any user confirmation. Jun Hou et.al [3] proposed an intelligent home security system using Zigbee to monitor

important locations inside a home through a surveillance camera. When the system was triggered by any penetration, the user will be notified through SMS and Multimedia Message Service (MMS). The temperature and gas sensor were connected to the system motherboard using Zigbee modules and forming a Wireless Sensor Network (WSN). Even though it can be included as one of the most advanced system, the system motherboard used to manage the WSN was too expensive. Rakesh V S et.al [4] improved real-time surveillance system for home security system using Beagleboard SBC, Zigbee and FTP Web server which monitor important locations inside a house using camera and detecting smoke. When smoke or intruder movement is detected, the system sends warning messages through SMS to cell phones, starts capturing realtime video for fixed duration and makes the alarm on. But this system only sends SMS to warn the user and cannot broadcast the live streaming video as the system record the video only. Moreover, the single board computer used is expensive and has lower technical specifications compare to the Raspberry Pi.

## **Block diagram**



### III. PROPOSED SYSTEM

#### 1. IoT-Based Sensor Network:

The core of the proposed system involves a network of IoT-enabled sensors strategically placed throughout the home for real-time monitoring.

These sensors include motion detectors, door/window sensors, gas leak sensors, smoke detectors, and cameras. Each sensor continuously monitors the environment for unusual activity, such as unauthorized entry, gas leaks, or fire outbreaks. The data from these sensors is transmitted to a central IoT hub for analysis and action.

#### 2. Cloud-Based Monitoring and Data Storage:

All sensor data is sent to a cloud server where it is processed and stored. This cloud-based architecture enables real-time monitoring of the home environment from anywhere in the world through a secure internet connection. The cloud also serves as a repository for historical data, which can be

accessed by users for reviewing past events or incidents. Advanced analytics can be applied to this data for pattern recognition and enhanced decision-making.

#### 3. Remote Access and Mobile Application:

The system offers a mobile application that allows users to access live feeds from security cameras, receive real-time alerts, and control smart home devices remotely. Users can arm or disarm the system, lock doors, or even monitor live video streams from cameras installed within the premises. Alerts are instantly sent to the user's smartphone through push notifications, SMS, or email whenever the system detects suspicious activity.

#### 4. Smart Automation and Integration:

The home security system is integrated with smart devices such as smart locks, lights, and alarms. When an intruder is detected or any abnormal activity is sensed, the system automatically locks the doors, activates the alarm, and turns on the lights to deter potential threats. The integration with other



smart home devices provides a seamless and efficient way to secure the home.

### **5. AI-Powered Anomaly Detection:**

The proposed system leverages artificial intelligence and machine learning algorithms to improve the accuracy of threat detection. By analyzing data patterns from various sensors, the system can distinguish between normal and suspicious activities, reducing the chances of false alarms. For instance, the system can learn daily routines and trigger alerts only when anomalies are detected, such as unexpected motion during odd hours.

### **6. 24 × 7 Monitoring and Emergency Response:**

The system operates 24/7, ensuring round-the-clock protection of the home. In the event of a security breach, fire, or gas leak, the system sends emergency alerts not only to the homeowner but also to pre-set emergency contacts and local authorities. The immediate response capability helps mitigate damage and enhances safety for the occupants.

### **7. Biometric and Facial Recognition:**

For enhanced security, biometric sensors or facial recognition technology can be implemented to restrict unauthorized access. This ensures that only registered individuals can enter the home, adding an extra layer of protection. The system can also automatically log entry and exit times of family members or regular visitors, providing a comprehensive log of daily activities.

## **IV.CONCLUSION**

24/7 smart iot based integrated home security system is an all in one approach which safeguard the user goods and properties by detecting fire ,gas and intruder whether he/she is inside or outside the house and by implementing this system we found that this system can also be improved by using image processing,otp based entry,speech recognision and home automation.

## **V.REFERENCES**

- [1] Kumar, R. Praveen, and S. Smys. "A novel report on architecture, protocols and applications in the Internet of Things (IoT)." In 2018 2nd International Conference on Inventive Systems and Control (ICISC), pp. 1156-1161. IEEE, 2018.
- [2] Md Saifudaullah Bin Bahrudin, "Development of Fire Alarm System using Raspberry Pi and Arduino Uno" in 2013 International Conference on Electrical, Electronics and System Engineering.
- [3] Ashish Shrivastava, "GSM based gas leakage detection system", in International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 1, Issue 2 (may-june 2013), PP. 42-45.
- [4] Cao Shunxia "Design Of Wireless Intelligent Home Alarm System" in 2012 International Conference on Industrial Control and Electronics Engineering.
- [5] A. Mahalingam "Design and Implementation of an Economic Gas Leakage Detector" in Recent Researches in Applications of Electrical and Computer Engineering .



- [6] Sajid M. Sheikh “Design and implementation of a raspberry-pi based home security and fire safety system” . Network”in 2011 International Conference On Electronics And Optoelectronics (ICEOE2011).
- [7] Jun Hou “Research Of Intelligent Home Security Surveillance System Based on ZigBee”in International Symposium on Intelligent Information Technology Application Workshops.
- [8] Yu Qiongfang ,Zheng Dezhong“Intelligent Fire Alarm System Based On Fuzzy Neural Network”.
- [9] Lian Chun-yuan “Design Of Intelligent Fire Alarm System Based On GSM
- [10] Datasheet of gas sensor MQ135 [Online]. Available: <https://www.olimex.com/Products/Components/Sensors/Gas/SNSMQ135/resources/SNS MQ135.pdf>
- [11] Datasheet of temperature and humidity sensor DHT11 [online]. Available: <https://www.mouser.com/datasheet/2/758/DHT11-Technical-Data-SheetTranslatedVersion-1143054.pdf>