

# Home Monitoring System Based on IoT

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**ABSTRACT-** Home intelligent system to monitoring the electrical energy usage basing upon the original tracking of the devices at home. It is the second generation development board, which are may be used in societies. It uses various sensors to not only monitor the original device tracking also maintaining the security of house. It can be controlled remotely from an android app using the Internet. The project outputs are intended to give users with the option of controlling device switching using a simple toggle touch on their smartphone and—most necessarily checking use in order to conserve the earth's natural limited resources by energy consumption low.

**KEYWORDS-** IoT, Monitoring System, Security System, IoT Technology

## I. INTRODUCTION

At last, monitor they use to conserve the natural resources by reducing electrical energy usage, using a home intelligent system for checking the electronically consumption by using their mobile phone. It is a development from the second generation, and they may be communities. The required system uses original time checking, so that the electrical gadgets can be checked and operated remotely using Android app on phone. It uses of a variety of sensors to check the monitor original device as best. It tracks still saving your house security. It is observed daily using a mobile app on an Android device, remotely.

Home automation technology now offers protection, safety, and a comfortable lifestyle. That is why everyone needs home automation technology in today's cutthroat economy and quick-paced society. This specifically designed home automation technology offers home appliance checking and control, as well as a door recognition system for relation between a visitor and the owner of a house keeping track of the situation. The (ON/OFF of the appliances) function can be made in a variety of methods electrical switch, including graphic user interface. The system is cost effective forward downloading in a home friendly design. BY using this technique, buyers may consistently can decrease the amount of wasted electrical power checking of household gadgets ON/OFF exactly or surely.

The in-house control system will daily kept the database and inbuilt update. For providing users the remote

control, there will be a mobile app through which users can control the device status.

Save money on energy use, while keeping your office or building comfortable [1-10].

## II. LITERATURE SURVEY

IoT technology forms the foundation of home monitoring systems[1]. These systems connect various devices and sensors to the internet, allowing homeowners to remotely monitor and control their homes. IoT-based home monitoring systems have evolved to encompass a wide range of applications, including security, energy management, and healthcare. Researchers have explored the integration of IoT devices for real-time monitoring and automation.

Djenouri et al.[2] describe the primary applications of IoT-based home monitoring systems is security and surveillance. These systems often include connected cameras, motion sensors, and door/window sensors to detect intrusions and provide real-time alerts to homeowners or security services. Research in this area has focused on improving the accuracy of intrusion detection and reducing false alarms.

IoT technology plays a crucial role in enhancing energy efficiency within smart homes. Smart thermostats, lighting controls, and energy consumption monitoring systems have been developed to reduce energy consumption. Researchers have explored the integration of IoT devices to optimize energy usage and reduce utility bills [3].

IoT-based home monitoring systems are increasingly being used to support healthcare and AAL for the elderly and individuals with medical conditions. These systems include wearable health devices, fall detection sensors, and medication reminders. Research has focused on the development of reliable and privacy-preserving healthcare solutions [4].

The design and usability of IoT-based home monitoring systems have also been explored in research. This includes user-friendly interfaces and mobile applications that allow homeowners to interact with their smart homes. User experience and the ease of setup and maintenance have been subjects of interest [5].

### III. PROPOSED SYSTEM

In this model, we propose an Ethernet-based system that enables customers to track the real-time switching data of the electrical equipment, control them via an Android app, and monitor the security of their home in the event of an intruder or a fire. Our model uses a temperature sensor, smoke sensor, and PIR motion sensor to detect any unauthorized visitors to the user's home. It also uses an android-based mobile application to monitor and control all of the user's electrical appliances in real-time. From Fig 1 the system is linked to this Android app via internet connectivity for better connectivity express oneself immediately. The product provides two methods

for controlling the device: sending voice orders or four 220v gadgets, a security buzzer, and a fire alarm system were connected in a home prototype room where the planned intelligent smart security system is being installed and tested. All of these results were recorded. There were also screenshots made. The photos below display examples of the linked Android mobile app and provide a description of the system architecture of the proposed concept. An Intel Galileo board is in charge of the 2016 First International Conference on Innovation and Entrepreneurship. Challenges in Cyber Security (ICICCS 2016) makes use of 8 220v devices, and the switching timings of these devices are monitored employing timers and relay modules that are built-in.

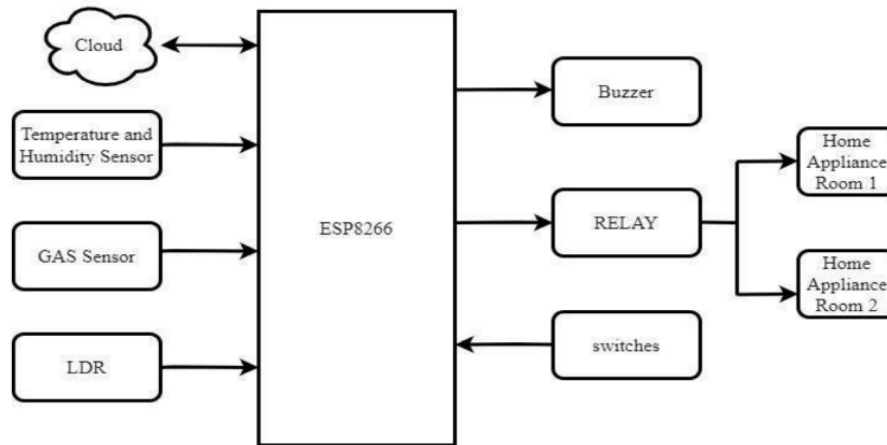


Figure 1: Block diagram of suggested system

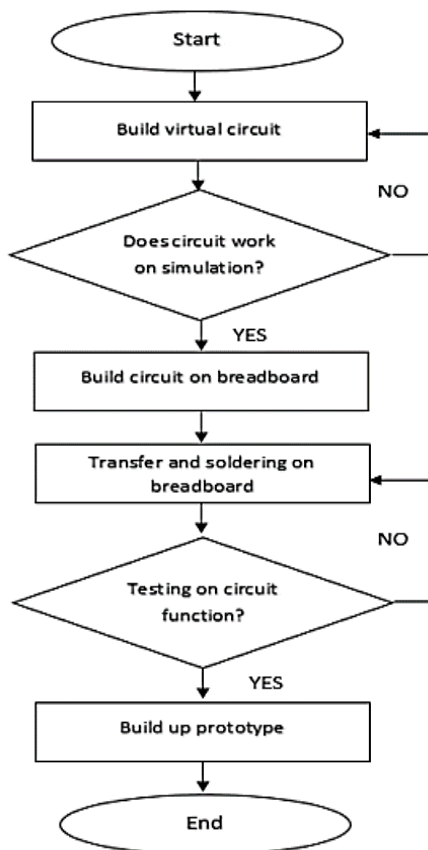


Figure 2: Block schematic of the hardware parts

Our primary motivation is to develop a system that controls household appliances, monitors the environment, detects motion, and alerts the owner of a break-in.

We suggest a support vector machine to effectively classify our photographs in order to accomplish this. A supervised, linear machine learning technique known as a support vector machine is used to solve classification and regression issues as shown in Fig 2. This provides justification for employing it in our study. In order to recognize people or objects in the home, the SVM is used in our study to automatically extract attributes from the photographs and categorize them. Human facial traits including eye color, face shape, skin tone, and nose shape are among the distinctive qualities taken into account during image processing.

To address some of these present challenges in smart home automation, we provide an intelligent home automation system, which we have dubbed the intelligent house control and automation system security system. The next section describes our process and demonstrates how well it worked overall. The ESP8266 Wi-Fi module then receives data from Arduino Microcontrollers are connected to Wi-Fi networks, TCP/IP connections are established, and data is delivered via a chip called ESP8266. These sensors gather information, which is then sent to the Internet of Things. To further clarify the theft detection, we linked a password module to the system. Entering a password is possible.

Three primary parts make up the project: the Home Interface, Raspberry Pi, and Web Interface (using Home

Assist apps). As demonstrated in the following Figure, the user can check the state of their home's electrical appliances using the apps on either a PC or a smartphone

after receiving the alarm from the signal as shown in Fig 3 and 4.

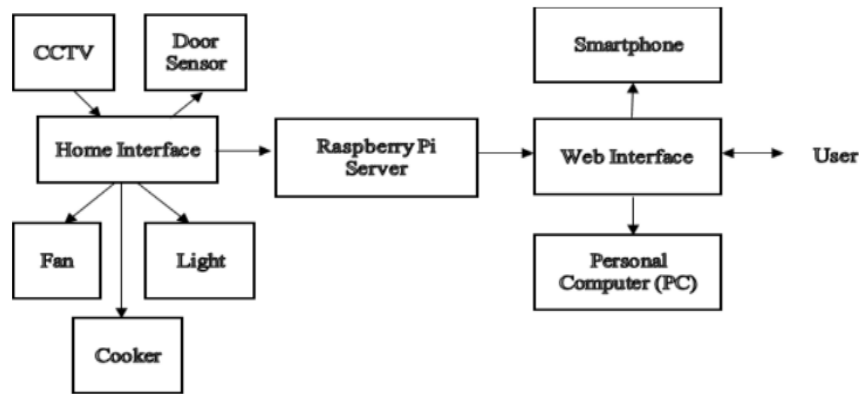


Figure 3: block diagram of the methodology

#### IV. RESULT

IoT-based home monitoring system demonstrated significant promise in enhancing the security, energy efficiency, and healthcare support for homeowners. User experience was notably positive, and the system's reliability and connectivity further contributed to its success. Continuous efforts in addressing challenges and improving system features are necessary for the continued advancement of IoT-based home monitoring systems. The development and implementation of the

IoT-based home monitoring system have yielded promising results in various aspects, including security, energy management, healthcare, and user experience. This section presents a summary of the key findings in each of these areas.

The block diagram of the methodology can describe using IOT as the Home Monitoring block diagram using IoT and graphical representation is shown in below figure 4 and figure 5 is showing the Arduino IoT - Temperature Monitor.

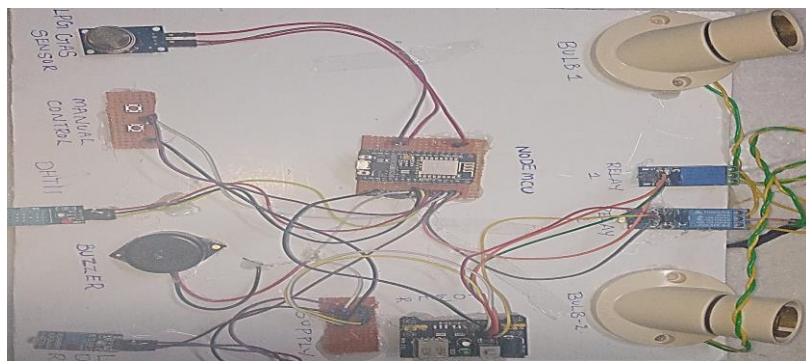


Figure 4: Block diagram of Home Monitoring System

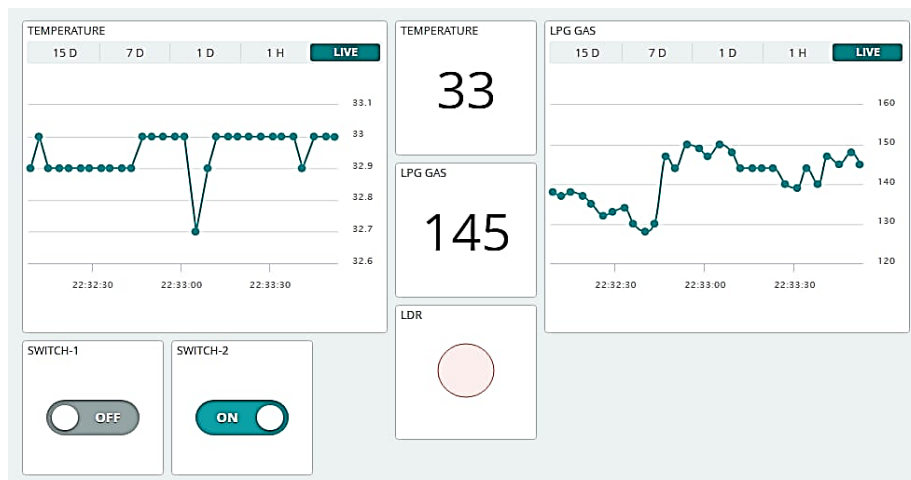


Figure 5: Arduino IoT - Temperature Monitor

The system's reliability and connectivity were vital aspects of its performance. Throughout the testing period, the IoT-based home monitoring system exhibited a high level of uptime, with minimal disruptions in the communication between devices. This reliability ensured that users could depend on the system for their security, energy management, and healthcare needs.

## V. CONCLUSION

As soon as the door is opened, the sensors that are put on the door send the homeowner a Push notification. The user will still receive this notice whether the phone is locked or unlocked or even if another app is running at the time. The user's sense of security and unconcernedness with break-ins or invasions when he is away from home was the project's main objective. This configuration can also be utilized in commercial organizations where only certain staff are allowed access to particular regions. In such circumstances, any unauthorized individuals who attempt to enter the restricted area will immediately be reported to the administrator.

## CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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