



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 10, Issue 11, November 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.569

9940 572 462

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IOT Based Smart Security System from Theft and Other Kind of Hazard

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ABSTRACT: Smart homes and enterprises have become extremely popular in recent years. A smart home is a home that is intelligent or automated, including home appliances that can be controlled and monitored from afar. Any organisation, bank, or residence should have a security system in place. The main purpose is to safeguard people and their belongings from numerous threats such as fire, crime, and theft. The Internet of Things (IoT) is a physical network of things or objects—devices, buildings, vehicles, and other items that are integrated with electronics, software, sensors, and network connectivity to collect and share data.

KEYWORDS: Smart homes, Internet of Things (IoT), home appliances, numerous threats.

I. INTRODUCTION

Home monitoring and security systems have been increasingly significant in recent years, and they may be used by any company, including banks and residences. It is becoming increasingly difficult to maintain a house or office safe in today's hectic world. Certain items must be protected, especially in industrial regions, and electronic security-based services are necessary [1]. Home security is becoming increasingly important. Leakage of raw gas and fire are the most critical requirements of home security these days, as the possibilities of access and robbery increase [2].

In several industries, monitoring systems are commonplace. Home privacy must always be protected, and no outsider should be able to intrude in any form. There's no need to worry about house security any longer, thanks to new advancements in home security, because security systems are here to take care of it. A home security system is the most effective burglar deterrent available. A home security system should provide security and safety features for homeowners by alerting them to natural, unintentional, and/or human risks such as fire, flooding, theft, animal invasion, and so on. The primary goal of this project is to ensure complete security [3].

II. LITERATURE SURVEY

Ms. Devkar A. R. et al. [4] demonstrate how to build an advanced electronic security system using small PIR and IR sensors and an Arduino controller. PIR and IR sensors detect the presence of an intruder, and the controller receives the signal from the sensors. If an intruder is detected, the buzzer and lights in the room are turned on, and a call is made to a predetermined number via a GSM modem. At the same time, the controller activates the camera, which records the image of the intruder. There are two types of sensors in the system. PIR stands for Pyroelectric Infrared Sensor, also known as Passive Infrared Sensor. The adaptable independent, low-cost smart industrial system presented by Dhara Gandhi et al. [5] is based on the Android ADK connecting with the Arduino Platform, allowing industrial security and emergency systems to be activated. To demonstrate the feasibility and effectiveness of the proposed smart industrial system, devices such as light switches, power plugs, temperature sensors, touch sensors, sound sensors, intrusion detection sensors, smoke/gas sensors, IR sensors, and sirens with blinking LED have been integrated into the system.

Abhishek Sharma et al. [6] have developed a mobile robot that can detect and respond to emergency circumstances. There have been numerous instances in the recent past where traditional security solutions have shown to be ineffective. Furthermore, current systems rely on Wi-Fi connectivity, which is problematic in a catastrophe event. The innovation comes in the form of GSM (Global System for Mobile Communication) for communication, so that the response is self-contained and disasters do not disrupt the system's operation. GPRS (General Packet Radio Service)



connectivity will also be used to provide real-time sensor data to the IoT server. Safa, H et al. [7] present a unique security solution based on the "things speak.com" open source cloud server and a low-cost esp8266 Wi-Fi module. The project contains a PIR module that continuously monitors the monitored space at home or at work. The PIR module delivers a signal to the Atmega 328p microcontroller when it senses an intruder, and the controller is connected to a Esp8266 wifi module as well as an alarm system. The system sends an alert signal to the open source cloud, which then sends an alert to the user's phone. A second esp8266 module is used in the system, which is programmed to work as a web server, allowing the user to activate or deactivate the security system using a web browser.

Kondamudi Siva Sai Ram and A. N. P.S. Gupta [8] describe an improved approach for monitoring weather conditions at a specific location and making the data viewable from anywhere on the planet. The Internet of Items (IoT) is the technology behind this, which is a cutting-edge and cost-effective solution for connecting things to the internet and connecting the entire universe of things in a network. Things like electrical gadgets, sensors, and vehicle electronic equipment could be found here. The system uses sensors to monitor and adjust environmental parameters such as temperature, relative humidity, light intensity, and CO2 level, and then delivers the data to a web page and a mobile app. Abhishek S. Parab and Amol Joglekar [9] present the design and implementation of a low-power GSM-based wireless home security system. The system is a wireless home network that includes a GSM modem and door security nodes that are magnets with relays. The system can react quickly if an intruder is detected, and the GSM module will send an alarm to the home owner. This security system is designed to alert a home owner wherever he is. In this system, a relay and magnet are put at the entry point to produce a signal through a public telecom network and transmit a message or divert a call that informs you about your home update or a predefined message that is embedded in the microcontroller.

III. METHODOLOGY

Figure 3.1 shows the block diagram of the proposed system. The proposed smart security system contains four types of sensors PIR, IR sensors, MQ-6 Sensor and IR flame sensor is used to detect the presence of flame around its range. PIR and IR sensors (PIR is a Pyroelectric Infrared Sensor or Passive IR sensor and IR: Infrared Sensor) are used to detect the presence of human intruder in the room. When the sensor senses the presence of intruder it gives signal to the Arduino controller. The MQ-6 Sensor is a semiconductor-based gas sensor which detects presence of gas in air.

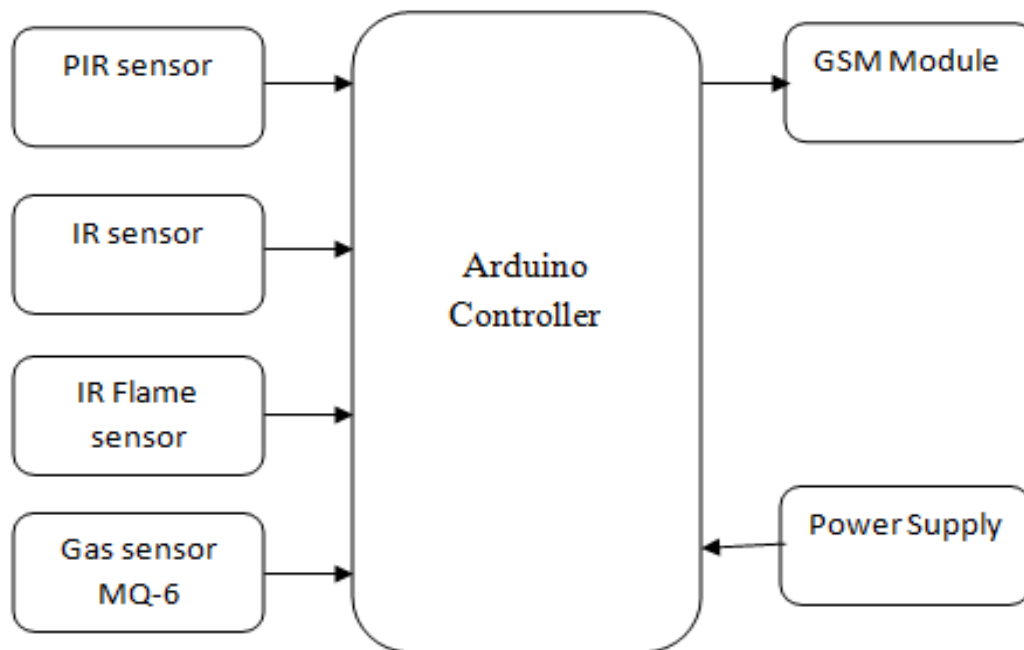


Figure 3.1 Block diagram of proposed system.

PIR stands for Pyroelectric Infrared Sensor, also known as Passive Infrared Sensor. It is made up of Pyroelectric sensors that detect thermal radiation that strikes it. Every live organism emits radiations, and the hotter the body is, the more radiations it emits. PIR sensors are usually made up of two IR-sensitive elements with opposite polarisation that are contained in a hermetically sealed metal case with an IR-transmissive window. Both slots detect the same quantity of IR radiation when the sensor is idle. When a warm body, such as a human or an animal, enters the sensing region of a PIR sensor, it causes a positive differential change in the sensor's output. When the warm body is no longer there, the sensor is turned off. The infrared sensor that detects humans. The infrared sensor sends out an infrared signal, which strikes the surface of an item in front of it and reflects back, which is received by the infrared receiver. The infrared sensor is made up of two parts: an infrared source and an infrared detector. A typical infrared source is an IR LED or an IR LASER diode. Photodiodes or phototransistors are used in infrared detectors. The IR source's radiation is reflected back from an object and falls on the IR detector. When an object is detected by an IR sensor, the output is LOW, and when there is no object, the output is HIGH.

The MQ-6 Sensor is a semiconductor-based gas sensor that detects the presence of gas in the air. They are generally used to detect gas in both residential and industrial settings. In gas sensors, the metal oxide SnO₂ is utilised. When SnO₂ is heated to a specific temperature in air, oxygen with a negative charge is absorbed on the crystal surface. As a result, the surface potential acts as a potential barrier to electron transport.

IV. RESULT

The MQ-6 Gas Sensor is a semiconductor-based gas sensor that detects the presence of gas in the atmosphere. They are usually used to detect gas in both households and businesses. In gas sensors, SnO₂ metal oxide is utilised. When SnO₂ is heated to a certain temperature in air, oxygen with a negative charge is absorbed on the crystal surface. As a result, the surface potential acts as a potential barrier to electron flow. In the presence of deoxidizing gas, which lowers the grain boundary barrier height, this potential barrier recognises the sensor's electrical resistance. Due to the lower barrier height, the sensor resistance falls. Figure 4.1 depicts the temperature command's output.



Figure 4.1 Temperature output

V. CONCLUSION

Home/industry monitoring and security systems have become increasingly vital in recent years to safeguard humans and property from numerous threats such as fire, crime, and loss, and they can be used by any organization, including banks and residences. We are going to create a system that will help avoid theft, toxic gases, and fire.

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