

## IOT BASED ANTI-THEFT SECURITY SYSTEM

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## ● Abstract

absence. It becomes quite important for the owner to be able to protect their assets from theft. The fundamental idea is to design a cost effective and efficient system for an individual to be able to detect any kind of theft in real-time and provide instant notification of the theft to the house owner. In this connection, we proposed the IOT based Anti-theft detection and alert system, which can alert the owner of the house. This system secures offices/homes from theft by instantly detecting theft as well as allowing users to view the theft details. In this system we use a camera, as soon as camera motion is detected then the system passes the information over IOT. Whenever the thief enters the house, then the motion of the thief is detected and immediately captures the images of the thief and alerts the owner of the house by message and call. This system also transmits the captured images of the thief through telegram over IOT to be viewed by users online. Thus, the system provides an innova detection using IOT. Keywords: IOT, Security, Anti-theft, alert system 2/10 ef

## I. Introduction

Internet of Things (IoT) is the networking of physical items with electronics built into its design to enable communication and the detection of interactions between them or with the surrounding environment. IoT-based technology will provide higher levels of services in the future years, effectively altering how individuals go about their everyday lives. Just a few categories where IoT is well established include improvements in medical, power, agriculture, smart cities, and smart homes. As of right present, there are more than 9 billion "Things" (physical devices) linked to the Internet.

The Internet of Things (IoT) has revolutionized the world with its ability to connect devices and make them work together seamlessly. The IoT can be used to create innovative solutions that solve real world problems. One such problem is theft and burglary, which is a

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growing concern for individuals and businesses. The purpose of this research papers to present an IoT-based anti-theft security system that can help prevent theft and burglary

Security has recently emerged as the most difficult challenge. When a burglar enters a locked residence, the sensor quickly records their movement and sends a signal to the controller. IOT system that alerts the owner and displays the image it has taken. A smart monitoring system called an anti-theft security system is employed to maintain security. The main goal of this project is to create a smart gadget that keeps an eye on a space where only those with permission are allowed. Prevention is preferable to treatment. The person will not suffer any losses if the theft is stopped.

## **II. Literature Survey**

I have proposed that the methods used by thieves and robbers to commit theft have likewise advanced. CCTV cameras are used for investigation and monitoring. Because a computer is required, CCTV cameras are costly. Continuous recording consumes too much space, and finding illicit activity also requires labor.

She has suggested a brand-new system that makes use of a Raspberry Pi to find the theft. When a burglar enters the residence, the system recognizes them and sounds the buzzer. That noise might warn the burglar and nearby residents.

I have proposed a research methodology that aims to design a general framework for notifying owners right away of an ongoing theft. The camera would see and alert the homeowner if a burglar entered through the door. A smartphone may be used to operate the door, and the technology claims to be security. The key flaw in this paper is that it only warns the owner via a pop-up warning when a burglar through the door.

Chalamhas proposed the innovative security technology to see a person's moment. In our life, security frames are the most crucial part. In this project, an IOT is combined with computer vision to determine the personal traits of each person. In the absence of the Owner, sensors are used to identify people. The sensor recognizes when a burglar enters

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the home and notifies the home's owner by sending a message, making a phone call, or taking a picture of the thief. The fundamental flaw in this article is that while it warns the owner through message, phone, or picture, it misses fast moving items and corner areas.

I have proposed a burglar-detection smart house anti-theft system. Additionally, the system offers real-time video data handling for home security. Even when the owner is not at home, the user may still keep an eye on the house from a distance. It does away with the need for a lot of memory for storing. This project guards against a cutting-edge smart home prevention technique. When an invader is a non-human, the system may successfully identify them and avoid false alerts. These procedures all result in the immediate reporting of intrusion by sending out notifications in real time. The sensor can identify the burglar and only records live video when he goes over the sensor, which is the paper's biggest flaw.

has proposed a new methodology that is utilized to discover the theft that is taking place at the time and notify the home's owner. This kind of device tracks the whole floor and records the thief's image.

Anywhere on the floor, a single step is monitored, and the owner is notified by notification and picture. The controller moves the camera to the region where the movement is detected and sends, to the owner in this system, which has a secure flooring tile connected to IOT. This paper's primary flaw is that it doesn't keep pictures of approved people.

### **III. Proposed System**

The system that is proposed in this project functions as an IOT-based anti theft security system employing a PIR sensor to record the mobility of the thief and an ESP 32-Cam microcontroller and camera to record the thief's face.

The suggested system additionally uses a GSM module to warn the home's owner via message and sends the taken image to the owner's email through IOT.

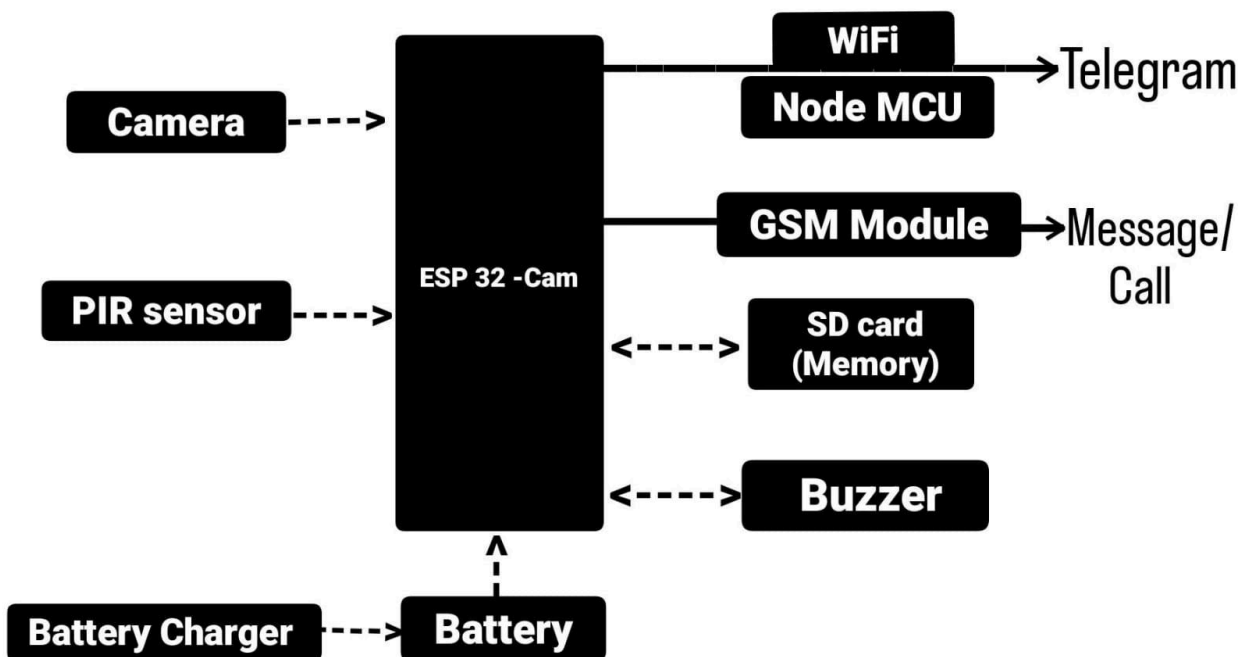
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The photographs taken by the authorized individual are kept on an SD card in our suggested method. The owner of the residence is promptly notified whenever an unauthorized person enters the home. It is simple to operate, doesn't frequently need human intervention to activate and disarm the system, and has a low false alarm rate. This suggested technology utilizes both electricity and battery backup to function well.

This model's primary goal is to offer a cutting-edge method of theft detection that warns the home's owner by offering a variety of options utilizing IOT.

### ● **System Architecture**

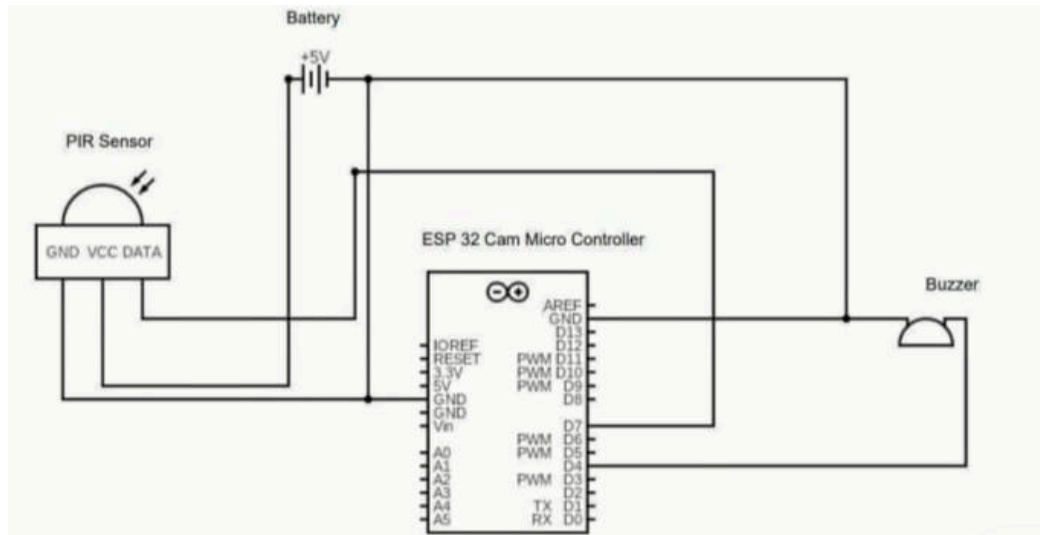


**Fig.1: System Architecture**

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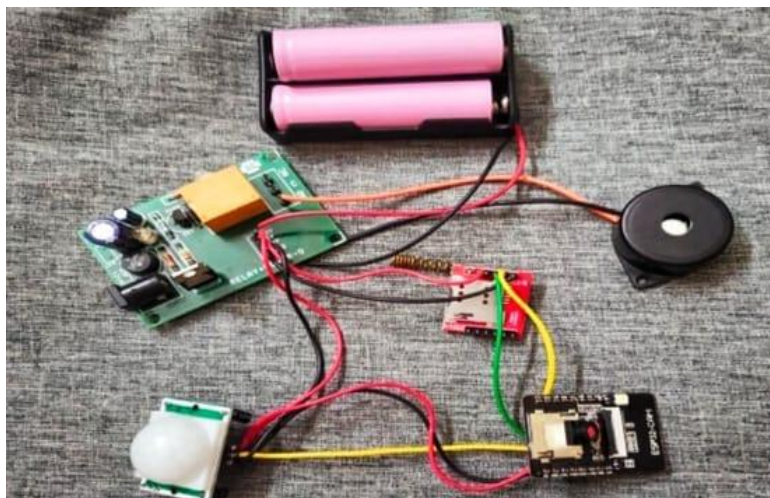
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## ● Circuit Diagram



**Fig.2 : Circuit Diagram**

## ● Components Connections



**Fig.3: Components Connections**

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## ● Workflow of the Hardware

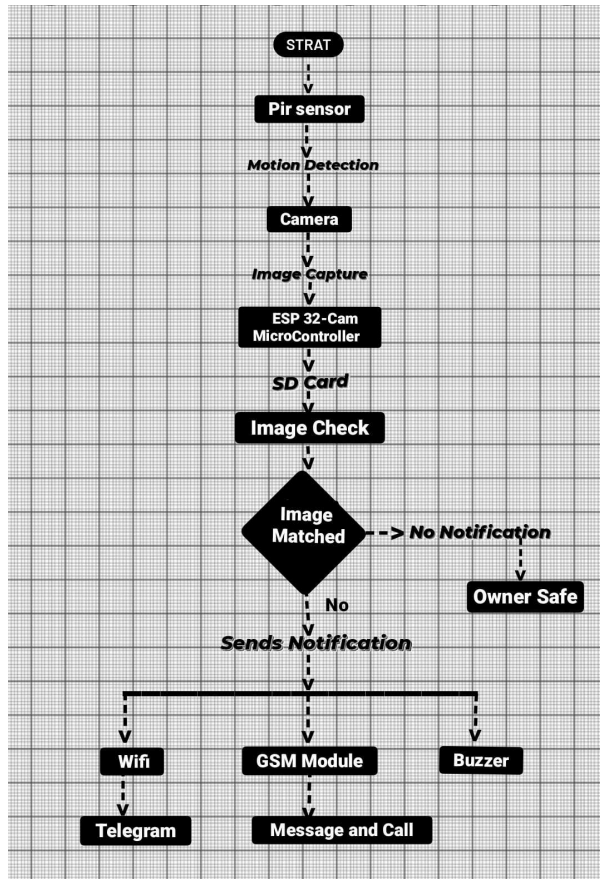


Fig.4: Workflow of the Hardware



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## Snippet for Connecting to Wi-fi and Telegram Bot

```
#define CAMERA_MODEL_AI_THINKER
#include "camera_pins.h"
const char* ssid = "vivo";
const char* password = "12345678";
const char* telegramToken = "6013196339:AAH72Hmt6tmBXefIIU-DMrNty6koylQJEG8";
int telegramChatId = your_telegram_chat_id;
String deviceName = "Project Bot";
String alertMessage = "THEFT ALERT...!!!";
```

## Snippet for capturing the image

```
void takePicture() {
    camera_fb_t* fb = NULL;
    fb = esp_camera_fb_get();
    if (!fb) {
        Serial.println("Camera capture failed");
        return;
    }
    Serial.println("Camera captured an image");
    bot.sendPhoto(telegramChatId, fb);
    esp_camera_fb_return(fb);
}
```

## Snippet for capturing an Alert

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```
void sendAlert() {
    Serial.println("Sending alert...");
    gsmSerial.println("AT+CMGF=1");
    delay(100);
    gsmSerial.println("AT+CMGS=\"+91 7680004067\"");
    delay(100);
    gsmSerial.print(alertMessage);
    delay(100);
    gsmSerial.write(0x1A);
}
```

### Snippet for sending the image

```
void setup() {
    Serial.begin(115200);
    pinMode(PIR_PIN, INPUT);
    pinMode(BUZZER_PIN, OUTPUT);
    digitalWrite(BUZZER_PIN, LOW);
    Serial.println("Connecting to WiFi...");
    connectWiFi();
    Serial.println("Camera initializing...");
    esp_err_t err = esp_camera_init(&camera_config);
    if (err != ESP_OK) {
        Serial.printf("Camera init failed with error 0x%x", err);
        return;
    }
    Serial.println("Camera initialized!");
    gsmSerial.begin(9600);
    Serial.println("Ready to detect...");
}

void loop() {
    if (digitalRead(PIR_PIN) == HIGH && !detected) {
        detected = true;
        Serial.println("Theft Alert...!!!");
        digitalWrite(BUZZER_PIN, HIGH);
        takePicture();
        sendAlert();
        bot.sendMessage(telegramChatId, alertMessage);
        delay(5000);
    }
}
```

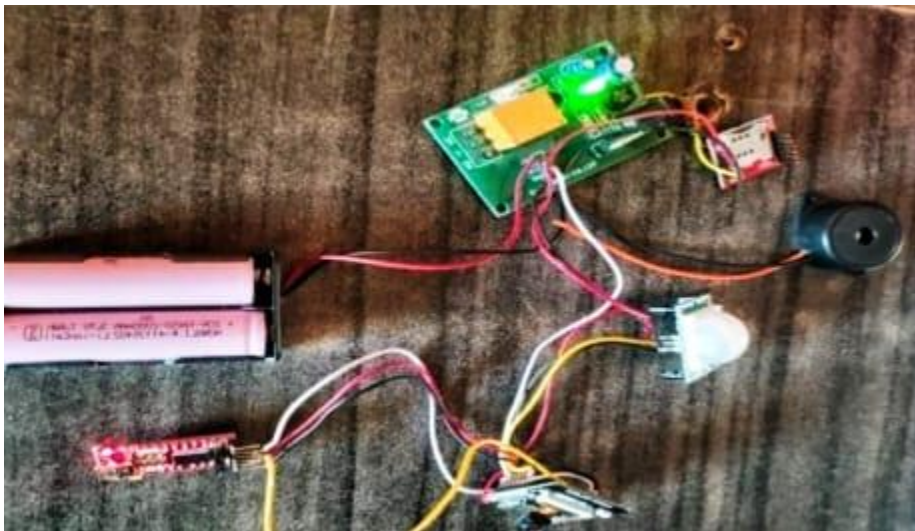
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## IV. Result analysis

In this we are implementing the module by using the ESP 32 Cam microcontroller. The ESP 32 cam carries all the instructions given through code and works accordingly. In the signal system the detection of the motion of the burglar is determined by the IR sensor and passes the information to the microcontroller and then the microcontroller notifies the owner in the various forms.

### ● LED Indication

LED indications in an IoT-based anti-theft security system, the user can quickly and easily determine the status of the system.

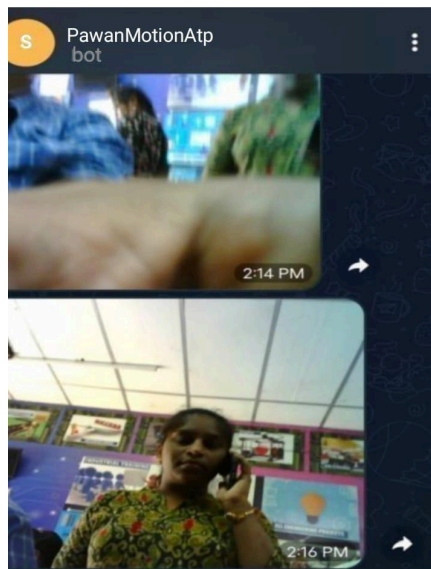


**Fig.7: LED Indication**

### ● Photo Indication

By providing indication of photo activity in an IoT-based anti-theft security system, the user can choose the most convenient way and stay informed about any detected intruders.

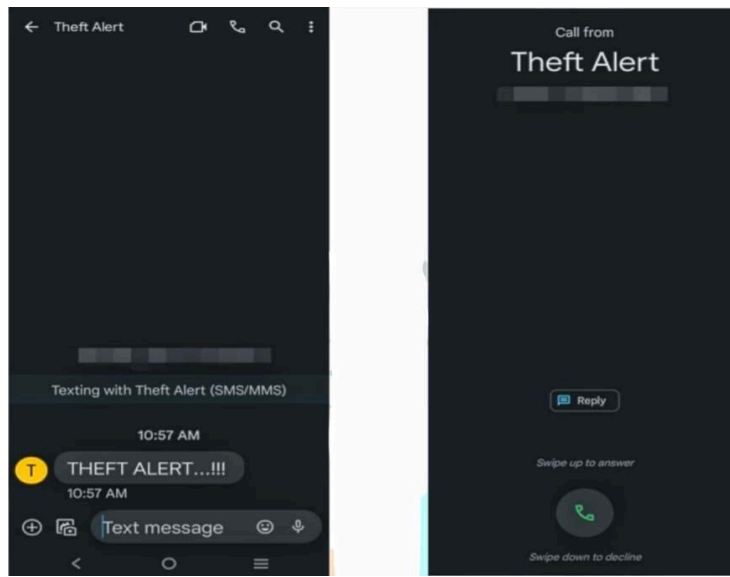
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**Fig.6: Photo Indication**

### ● **Message and call Indication**

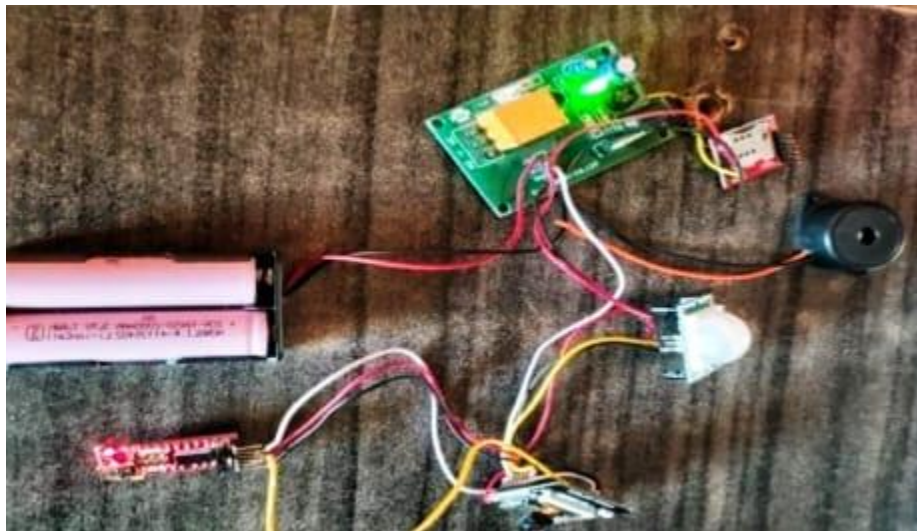
By providing indication of message and call activity in an IoT-based anti-theft security system, the user can be alerted to any system events even if they are not near the system or do not have access to the mobile app.



**Fig.7: Message Alert**

**Fig.8: Call Alert**

A Buzzer can also be used as an audible indicator in an IOT-based anti security system in order to alert neighbors of the house.



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### **Fig.9: Buzzer Indication**

## **V.Conclusion**

The proposed system provides a promising solution to prevent theft and burglary. The system uses low-cost sensors and cameras that are connected to a central hub, and can be customized to meet the specific needs of the user. The system can respond to a breach in real-time, which makes it more effective than traditional security systems. Future research can focus on improving the accuracy, security, and user experience of the system. Overall, the IoT-based anti-theft security system has the potential to be an effective and convenient way to protect valuable assets from theft.

## **●Reference**

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