Telegram Application Based Spy Camera

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Abstract - *Security is a major issue that needs to be addressed in today's society. When it comes to home security, we present a system that uses the Internet to provide our users with an easy way to control various home appliances. Nowadays, technology is developing rapidly, which leads to the modernization of the home security system. Home security is a very useful IoT application and we use it to create a low-cost home security system. A home security system using ESP-32 CAM and the Telegram application is a project that aims to increase the security of homes and other private spaces. The system consists of an ESP-32 CAM module that captures live video footage and sends it to a Telegram bot. When motion is detected, the bot then sends a notification to the owner's Telegram account. The project is implemented using the Arduino IDE and various libraries, including the Telegram Bot Library and the ESP32 CAM library. The system is designed to be inexpensive, easy to install and use, and highly effective in preventing burglaries and other security breaches. The project provides innovative solutions for increasing home security using modern technologies and communication channels.*

1. Keywords - Home security, Internet of things, Arduino, ESP32-CAM, Telegram application.

2. INTRODUCTION

A home security system is an essential part of modern home automation. The system is designed to protect your home, family and valuables from intruders, thieves and other potential security threats. One effective way to implement a home security system is to use the ESP32CAM module and the Telegram application.

The ESP32CAM module is a low-cost, low-power and compact development board that combines Wi-Fi connectivity and image processing capabilities. It is equipped with a high-definition camera that can capture clear images and videos of your home environment. By integrating this module with the Telegram application, you can receive real-time alerts and notifications whenever the system detects any suspicious activity or movement.

To set up this system, you will need to install and configure the ESP32CAM module and the Telegram application. Once the system is up and running, you can customize it to suit your specific needs by setting sensitivity levels, adjusting camera angles and defining detection zones. This this way, you can ensure that your home security system is tailored to your unique security requirements.

Home security systems are becoming increasingly popular as people seek to protect their homes and families from theft, vandalism, and other security threats.

Overall, using the ESP32CAM module and the Telegram app is an effective way to implement a home security system that can help you protect your home, family, and valuables. With this system, you can have peace of mind knowing that your home is safe and well protected against any potential security threats.

3. MOTIVATION

The main motive of this system is to control household appliances and electronic devices using a surveillance system. The surveillance system is designed so that everyone can access it. Home security is an important concern for many people as it helps ensure the safety of their possessions and loved ones. There are different ways to approach home security, but one effective method is to use a home security system that can monitor premises and alert the home owner to any unusual activity. The motivation for developing a home security system using ESP32-CAM and Telegram is to provide homeowners with an affordable and accessible solution to monitor their homes and increase their security. Using automated technology and real-time communication, potential security threats can be quickly identified and addressed, ultimately contributing to a safer and more secure home environment.

4. LITERATURE SURVEY

1. The development of home security systems using ESP32CAM and Telegram has received significant attention in recent years. A survey of the literature on this topic reveals various approaches and techniques proposed by researchers to enhance home security using these technologies.

2. In the paper "Home Security System Based on ESP32-CAM and Telegram Bot" by Li et al. (2020), a smart home security system using ESP32-CAM and Telegram Bot was designed. The system included a camera module for taking pictures of the home environment, which were then transmitted

user's smartphone via Telegram. The system also included motion sensors and infrared sensors for motion and intrusion detection.

3. In the article "Design and implementation of a low-cost home security system based on ESP32CAM" by Liu et al. (2021), a low-cost home security system using ESP32CAM was designed. The system used Wi-Fi to transmit images and data to the user's smartphone, and also included motion sensors and door sensors to detect intrusions.

4. In the article "Home security system using ESP32-CAM and Telegram application" by Narkhede et al. (2021), a home security system was designed using ESP32-CAM and Telegram. The system included a camera module for monitoring the home environment and transferring images to the user's smartphone via Telegram. The system also included a PIR sensor for motion detection.

5. In the article "Internet of Things-Based Home Security System Using ESP32CAM and Telegram Application" by Shinde et al. (2021), an IoT-based home security system was designed using ESP32CAM and Telegram application. The system used Wi-Fi to transmit images and data to the user's smartphone, and also included motion sensors, door sensors, and smoke sensors to detect various threats.

6. In the article "Smart home security system using ESP32CAM and Telegram application," by Zhao et al. (2021), a smart home security system was designed using ESP32CAM and Telegram. The system used Wi-Fi to transmit images and data to the user's smartphone and also included motion sensors, door sensors and temperature sensors to monitor the home environment.

5. PROBLEM STSTEMENT

The problem of owners not being able to know what is happening in their house when they are not at home, besides problems such as thefts and fires in the home when the user is at home can be overcome with this system.

FLOWCHART

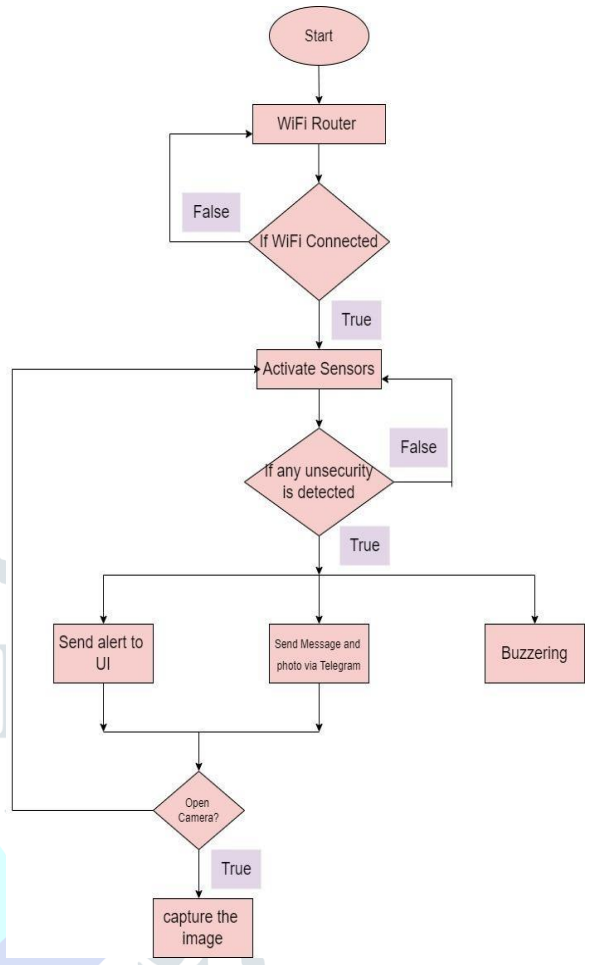


Fig.5.1 Flowchart

6. BLOCK DIAGRAM

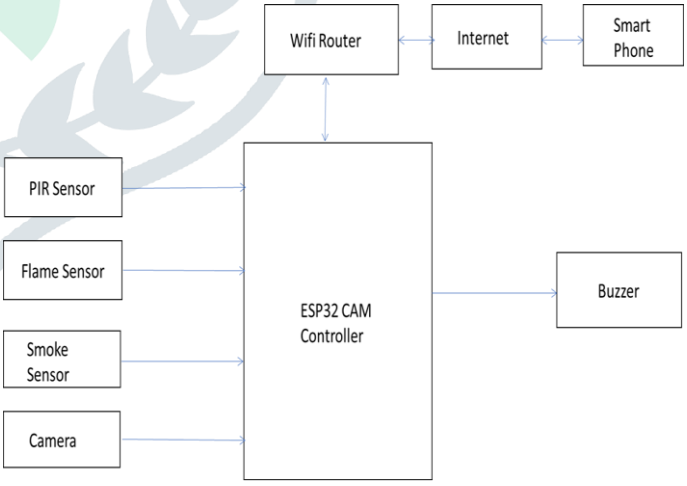


Fig.6.1 Block Diagram

7. CIRCUIT DIAGRAM

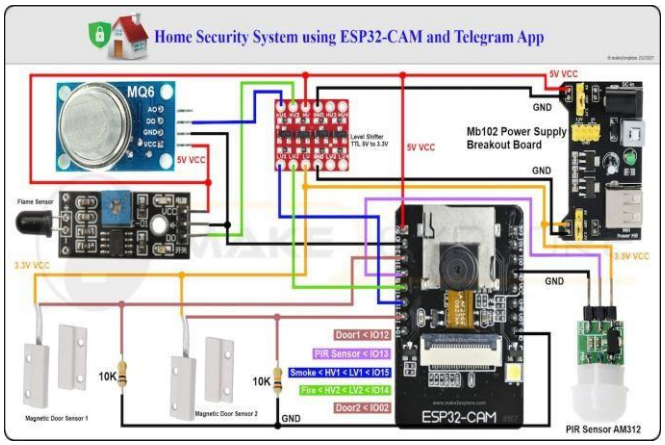


Fig.7.1 Circuit Diagram

8. ALGORITHM

Step 1: - Install and set up the ESP32-CAM module and connect it to your home Wi-Fi network.
Step 2: - Install Telegram app on mobile device and create new bot using Bot Father service. Note the bot token and chat ID.
Step 3: - Connect ESP32-CAM to Telegram bot using bot token and chat ID.
Step 4: - Define trigger conditions for the security system such as motion detection or door/window opening.
Step 5: - Write the code for the ESP32-CAM to detect the trigger conditions and perform the appropriate actions such as taking a photo or recording a video.
Step 6: - Use Telegram API to send the captured media to the Telegram chat associated with the bot.
Step 7: - Define the action to be taken when the security system is triggered, such as triggering an alarm or notifying the home owner.
Step 8: - Write the code for the ESP32-CAM to perform the defined action when the security system is triggered.
Step 9: - Test the system thoroughly and make necessary settings

WORKING

The ESP-32 CAM AI THINKER module is a microcontroller, which is an ESP-32 development board with an Ov2640 camera, support for Micro SD cards, built-in flash and several GPIOs for connecting peripherals. In our project, there is a mini-PIR motion sensor (AM312) which is used to detect whether a person has moved in or out of the door with the range of the sensors. A magnetic (Reed/Switch) door sensor is used to sense whether the door is open or closed. MQ6 gas/smoke sensor used to detect gas leaks in the home. The flame sensor module is used to detect the occurrence of fire in the home. A router is a device that it provides Wi-Fi and is connected to a modem that sends information from the Internet to the Telegram application. If the sensor detects any problem in the home, it will alert the telegram application by capturing and sending a photo with a message and we can respond with a command designed to activate and deactivate the sensors.

COMPONENTS

ESP32-CAM: - ESP32-CAM is a small, low-power camera module based on ESP32. Comes with OV2640 camera and provides TF card slot. ESP32-CAM can be widely used in intelligent IoT applications, such as wireless video monitoring, Wi-Fi image recording, QR identification and so on.

Fig.8.3.1 ESP32-CAM

PIR Sensor: - PIR (passive infrared) sensors utilize the detection of infrared that is radiated from all objects that emit heat. This type of emission is not visible to the human eye, but sensors that operate using infrared wavelengths can detect such activity.

Fig.8.3.2 PIR Sensor

Flame Sensor: - The flame sensor of a furnace is a safety device that detects whether the equipment is producing a flame and burning gas. A sensor which is most sensitive to a normal light is known as a flame sensor. That's why this sensor module is used in flame alarms

Fig.8.3.3 Flame Sensor

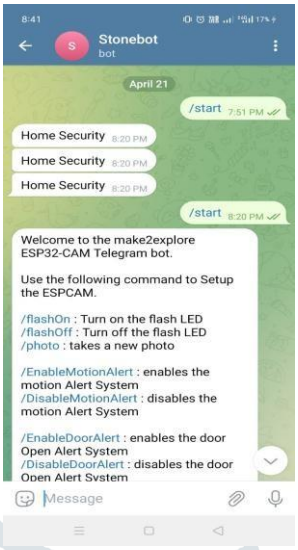
Smoke Sensor: - Smoke alarms detect fires by sensing small particles in the air using a couple of different kinds of technologies. Once they detect those particles above a certain threshold, they signal the alarm to sound so that you and your family can get to safety and call 911. Smoke alarms save lives

Fig.8.3.4 Smoke Sensor

Magnetic Door Sensor: - A door contact sensor works using a sensor and a magnet. The sensor has an internal reed switch that is closed when it is in direct proximity with a magnet. When the door is opened, the magnet is separated from the sensor. This releases the reed switch, and the sensor alerts the panel.

Fig.8.3.5 Magnetic Door Sensor

RESULTS



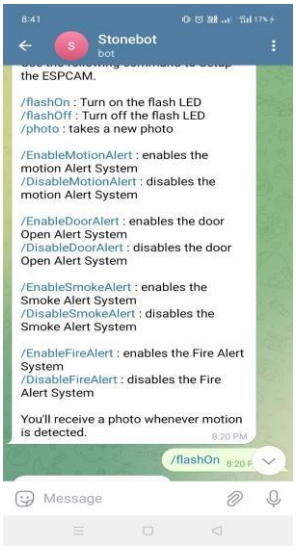


Fig.8.4.1 Results

3. CONCLUSIONS

In conclusion, a home security system using ESP32CAM and the Telegram app can be an effective and cost-effective solution for securing your home. The ESP32CAM is a powerful microcontroller that can handle image and video processing, and its integration with Telegram enables real-time monitoring and alerts. With this setup, the ESP32CAM can capture images or videos of any potential intrusion and send them to your Telegram account for immediate action. In addition, you can remotely control the ESP32CAM, such as turning it on and off or adjusting its sensitivity using telegram commands.

Overall, this DIY home security system provides a simple yet effective way to secure your home and with its open-source nature, you can customize and expandit to fit your specific needs

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