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HOME SECURITY USING IOT

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ABSTRACT: -The use of smartphone technology as a tool for communication is ever-increasing, and this technology shows no sign of decline. Moreover, since the era of social networking, smartphones have become a significant entity that humans cannot do without. Internet of things has now opened a new era where we can keep contact data, surf the internet, exchange messages, take notes, carry files and documents, etc. Besides, we can now control hardware like lights, fans, air conditioners, etc.
This research aims at designing home security systems to keep selected space safe from intruders and detect gas leakage. The methodology integrated ultrasonic sensor, and gas detectors to implement the wireless remote home security technology. This system adopts Blynk technology for optimal functionality and is programmed to respond rapidly as intrusion or gas leakage is detected.
KEYWORDS: - ESP32, Sensors.

1. INTRODUCTION

Concerns about security, in general, grow continually, as well as the study to address these concerns. Several intrusion detections prototypes have been developed. While some aim at preventing intrusions such as systems used in classified facilities or banks, others are just built for detection [1]. Although some techniques are more reliable than others, it is always at the expense of cost [2].
The web-based security system and hardware-based system are often made of fancy designs and feature high prices throughout shelves of malls. This implies that commoners, in most cases, cannot afford this equipment. Hence, phone-based technology was adopted to make use of the GSM module with Arduino Uno.
This system is designed with the convenience of installation, safety, and cost in mind, which necessitated the below-listed components:

- Infrared sensor
- Ultrasonic sensor
- GAS Sensor
- Flame detection Sensor
- Water Sensor
- LDR Sensor

2. EXISTING METHOD

Gill et al. (2009) explains network enabled digital technology is rapidly introduced in the home automation. For the purpose of home automation this technology introduces new and existing opportunities to increase the connectivity of the devices. The remote-control technology is rapidly synchronizing with the expansion of Internet.
Upadhyay et. Al. (2016) proposed a Home Indoor Positioning System (HIPS), provides location of mobile devices like smart phones and location based IoT applications. This paper introduces home indoor positioning system using Wi-Fi signals. In proposed system an intelligentmobile robot automatically constructs radio maps for the system.
Shetel and Agarwal (2016) explains in their paper that IoT enables internet connectivity for all kind of devices and physical objects in real time system. The virtualization of this system enables to

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perform activities without direct physical synchronization between the devices. The IoT enables to manage multiple jobs without any limitation of distances with the help of intelligent devices and high-speed network.

Lee et al. (2017) explains in their paper the web of physical objects is Internet of Thing which contains the embedded technology helping in developing machine to machine or man to machine communication. This paperprovides a dynamic data sheet about the city environment parameters taken from the stand-alone system.

Chou et al. (2017) describes in their paper a home automated system has remote controlled operation. This paper discusses about the problem on their installation, finding out the various solutions through different network technologies and trying to optimize the use of these system. The Home Automation System (HAS) requires heterogeneous, an eternal and distributive computing environment's careful study to develop the suitable HAS.

Kamal et al. (2017) explains in their paper how this paper used Raspberry Pi as the network gateway. This paper uses MQTT(Message Queuing Telemetry Transport) protocol for sending and receiving the data. All the sensors used in this paper is been controlled by the web page implementing the Access Control List (ACL) for providing encryption method for the safe transaction of the data's. This paper uses various sensors, wired and wireless, are connected with the Raspberry Pi.

3. PROPOSED METHODOLOGY

In this paper we are proposing a Home Security System where the input is taken from the live person. In this paper we are using Raspberry pi and Internet of Things. In this project we are making a database for the family and we are taking 30 photos of each of them. As male do have change in appearance in every few days, it will be easy for the algorithm to make sure whether the person is coming is authorized or not. For making this happen we are using haar algorithm in open CV.

The image is taken from the live video streaming and saved into the data base. For saving the memory we are converting each image into the grey scale, using grey scale conversion. Each image has width of 130 pixels and height of 100 pixels for taking the input image form the video streaming. Haar algorithm is basically having a cascaded version of many input for face parts to identify which part is which one. And with the particular calculations of each feature in face we can make a perfect face detection algorithm.

If some unauthorized person is coming near the home the camera will capture their photo and convert it into grey scale and compare with the database. If the image is already stored in database than then the pixels will be more accurate when the output is visible, where as when the input image is not stored in database the pixel will match the least.

Here we are showing how the computer is connected to the RPI. We need Wi-Fi connection for the connectivity of RPI through the system. And the main gateway for connecting the RPI is Internet of Things. IoT helps in the transaction of the data though one device to other, as the RPI is known as the machine to man and machine to machine transaction of the data.

The desktop is not potable and hence we cannot take it everyplace we go, we can share the screen using same IP address. First we have to connect the desktop with RPI and check the Wi-Fi connection, since the Wi-Fi connection is done, we have to connect our laptop with the same Wi-Fi connection. Now just seeing which IP address the RPI is using we have to give same IP address to the remote desktop connection in laptop and wait for the login screen. Once the login screen appears we have to write the correct credentials and login into the remote desktop, now the screen which we are seeing isas same the one on desktop. Now we can control it from the remote area location.

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4. COMPONENT DESCRIPTION

A. Ultrasonic Sensor

The ultrasonic sensor measures distance to an object with the aid of sound waves. It outputs sound waves at a specific frequency and inputs the return echo that bounces of obstacles. The travel time of the generated sound wave can then be estimated mathematically, after which, the estimated travel time is used to estimate the distance to the object.

Fig 1:HC-SR04 ultrasonic module

B.Gas sensor

The MQ series sensors were selected to aid in the detection of gas due to their sensitivity for several gasses which can be present indoor at room temperature. The analog output the signal is read with the analog input of the microcontroller.

The internal resistance, however, depends on the type of gas present, but the inbuilt potentiometer can be used to calibrate the sensors to the desired accuracy properly.

Fig 2:Gas sensor module

C. ESP32

a dual core MCU from Espressif Systems with integrated Wi-Fi and Bluetooth. If you worked with ESP8266, then ESP32 is a significant upgrade with a lot more features.

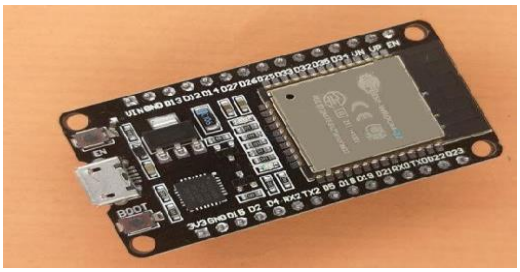

Fig 3: ESP32

D. IR Sensor

IR sensor is an electronic device that emits the light in order to sense some object of the surroundings. An IR sensorcan measure the heat of an object as well as detects the motion. Usually, in the infrared spectrum, all the objects radiate some form of thermal radiation. These types of radiations are invisible to our eyes, but infrared sensor can detect these radiations.

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Fig 4: IR Sensor

E. Flame Sensor

This flame sensor or fire sensor module works on the concept that when a flame or fire is burning it emits IR signals. This IR signal is then received by the IR receiver on the fire sensor module to detect the flame or fire.

The sensor has an operating voltage from 3V to 5.5V and has both digital and analog output. The sensitivity of the digital output can be controlled by the on-board potentiometer. Detection angle of sensor is 60 degree and range is theoretically 100cm but practically you can get upto 20-30cm

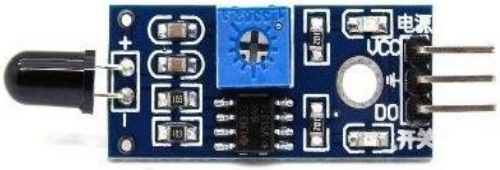
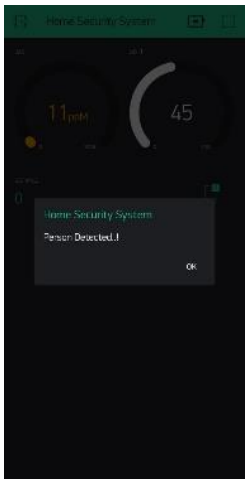
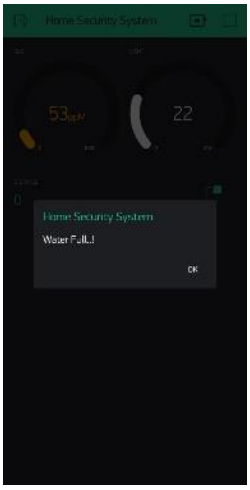
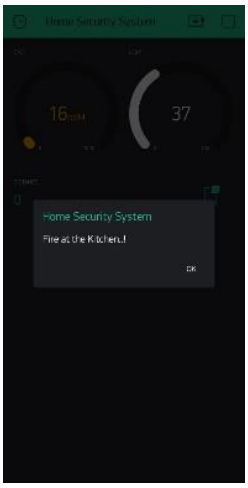


Fig 5: Flame Sensor

Results:







5. CONCLUSION

In this paper, we discussed IoT based home security system that provides a simple and easy way of detecting intrusion. The PIR sensor has been introduced and implemented in the design of this project. The UART communication between the hardware and the user of this system has been successfully established. The transmission of the phone calls is dependent on the state of the sensors. From the test conducted, the user gets real-time alerts through the technology employed, thereby making the system localization genuinely independent.

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