

Automated Security System using Surveillance

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Abstract

The world is experiencing a vast implementation of home security. And automation plays a vital role in the day to day life. The aim of this paper is to provide high level security and automation of appliances. This paper "Automated security system using surveillance" uses raspberry pi board which itself acts as a mini computer. Whenever a person enters into the room, the fans and light will automatically switch on. At the same time camera is also switched on and it takes the image of the person who has interrupted. The user is alerted by sending an SMS with the link using GSM modem. The image can be viewed by clicking on this link. In the absence of a person the fans and lights will automatically be switched off.

Keywords: Raspberry pi, SMS, GSM

1. Introduction

Home security refers to providing security in absence of the person for a comfortable and secured home. The system comprises of IR sensors, GSM modem, relay, raspberry pi interface board and camera. The IR sensors detect the interrupt and sends the information to the raspberry pi board which triggers the camera to capture the image. The device automatically alerts the owner with an SMS along with the link of the image, thereby increasing the security level. This system also automatically controls the fan and light. Thus the system is fully automated and provides high level security. This paper is named so because we control the devices automatically and provide protection to the places where security is required.

2. Existing project

According to our survey, the projects still now existed does not provide immediate alert incase of any unauthorized entry into the room. It requires manual power to monitor the room in order to ensure security. The acoustic sensors will detect the sound of the breaking glass and alerts the user. The CCTV camera captures the video and stores in the memory of the computer. For any reference the user can view the video but it is a tedious process. The image can also be captured and send as an Email or tweet notification is also generated.

2.1 Related work

The paper "Smart Surveillance Monitoring System Using Raspberry Pi and PIR Sensor" presents the idea of monitoring the particular place in remote area using smart phone. This system uses raspberry pi board and a camera to capture the information and sends it via a 3G dongle to the smart phone with the help of web.

The paper "Android Based Home Automation Using Raspberry Pi" describes the concept of controlling the appliances using android phones. The instructions are sent by the user from the remote area using the WiFi network. The Raspberry pi board enable the relay circuit and controls the appliances.

The paper "Access control of door and home security through internet" describes the system for controlling the door lock through the internet. The user will be notified about the visitor and commands whether to open the door or not.

The paper "Advanced Automation system in industrial applications using PIC microcontroller and GSM" checks the continuous status of the device. The microcontroller trips the circuit whenever there is a drip in voltage or current in a device and alerts the user through SMS.

The paper "Design and Implementation of Security Systems for Smart Home based on GSM technology" presents the idea of security alert in terms of sound and mail. Whenever there is a interrupt, alert will be given to the owner as mail through GSM technology.

The paper "Wireless home security system with mobile" presents the idea of enabling home security and control of domestic appliances through mobile

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phone using Bluetooth technology. The user can monitor particular place from any location and control the devices.

3. Proposed system

In the proposed system, the user gets immediate alert when someone enter the room. The system employs IR sensors to detect the persons entering the room and sends the output signal to the raspberry pi board for processing. The raspberry board drives the relay circuit to control fan and light and capture the image using camera. It also consists of GSM modem to send SMS (short messaging service) along with the link of the image.

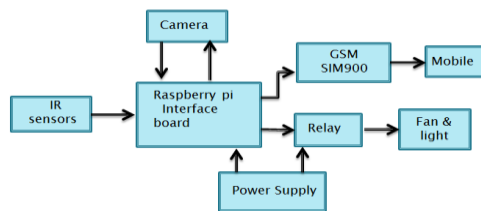


Fig 1 block diagram of the proposed system

4. Hardware description

4.1 IR Sensor

Infrared proximity switch photoelectric sensor includes a set of transmitter and receiver. The detection range is about 3-80cm. IR sensor operates at a power of 5V. The input signal is always high. The output signal of the sensor is LOW whenever it detects an object, which is connected to the raspberry board.

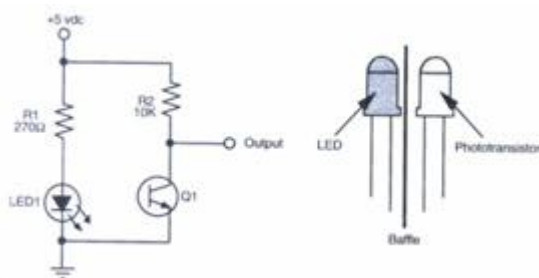


Fig 2 Basic block diagram of infrared proximity sensor

4.2 Raspberry pi board

The raspberry pi interface board almost acts like a mini computer. LINUX based Raspbian operating system is used. This system uses board Raspberry Pi interface board B, which employs SD card slots, micro USB power supply, 2 USB port, GPIO is the general purpose input output pin which can be used as both digital input, digital output to control and interact with real world, Ethernet port, HDMI out, audio and RCA video out. It also has (BROADCOM) BCM 2835 SOC, which is a 700 MHz processor. The power requirement for this board is 3.3 V. The SD capacity can vary from 1MB to 2 GB.

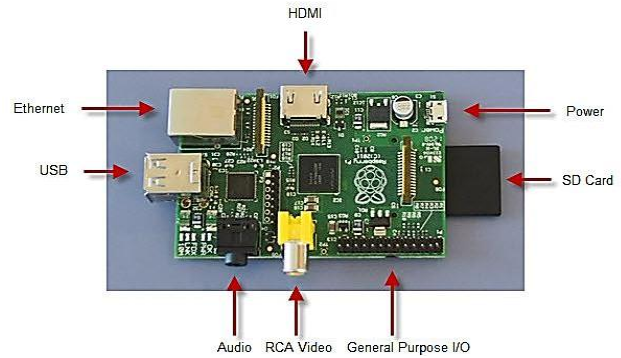


Fig 3 Raspberry pi board-model B

4.3 Raspberry pi camera

Raspberry Pi camera is used in this system, to capture the image. High-definition video and images can be captured using this camera. It's a five megapixel fixed-focus camera. A 15cm ribbon cable is used to connect the camera with the Raspberry Pi board.

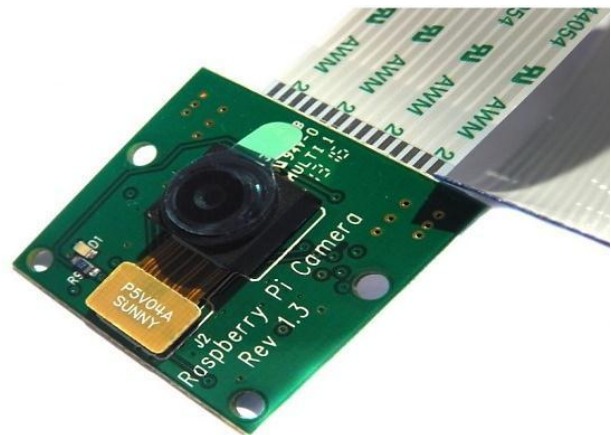


Fig 4 Raspberry pi camera

4.4 Relay

Relay is used to switch ON and OFF the fans and lights based on the control signal from Raspberry Pi interface board. Relays are commonly used to control several circuits by one signal. The Relay is controlled by the Relay drive circuit.

4.5 GSM Modem

This system is used to alert the user by sending SMS with the link using Global System for Mobile communication (GSM) modem, which is controlled by simple AT commands. GSM sim900 is an ultra-compact and reliable wireless module. Its dimensions are small and cost effective with complete dual band 900/1800 MHz. It is mainly used to send and receive SMS&MMS, make and receive calls. It communicates with the Raspberry board using RS232.



Fig 5 GSM module

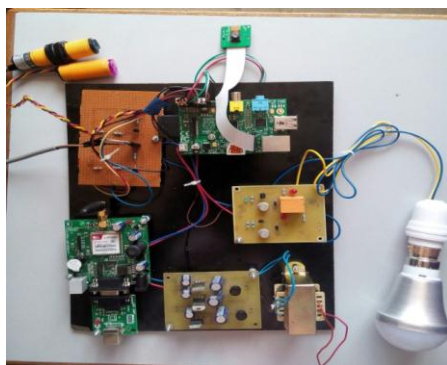


Fig 6 Hardware of the Designed system

5. Result:

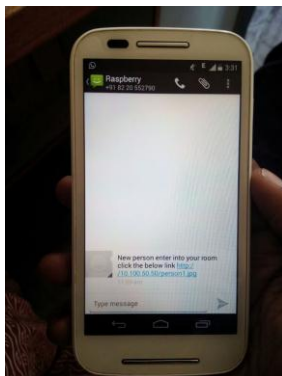


Fig 7 Result of proposed system

Conclusion

The “Automated security system using surveillance” provides security and controls electrical devices. This system is very comfortable because of using mobile technology. It is reliable and provides privacy on both the sides. Necessary action can be taken in a short span of time incase of an Emergency.

Future Development

The voice alarm circuit can be added to this system which indicates that the room is full and the persons cannot enter. The devices such as TV, Washing machine, can also be controlled.

References

Jayashri Bangali and ArvindShaligram, (2013),Design and Implementation of Security System for Smart Home based on GSM, *ijsh* ,7,201-208

Shaiju Paul,Ashlin Antony B,(2014),Android Based Home Automation Using Raspberry Pi, *ijcat*, 1,issue 1.

Sanjana Prasad ,P.Mahalakshmi,A.John Clement Sunder,R,Swathi, (2014), Smart Surveillance Monitoring System Using Raspberry Pi and PIR Sensor, *ijcist*,7107-7109.

V.Sathya Narayana,S.Gayathri, (2013), Design of Wireless Home Automation and Security System using PIC Microcontroller, *ijcaes*, 3.

Mohammad Arif Hossain, Md.Nazmul Hasan ,(2014),Modern Home Automation System Based On AVR Microcontroller, *international journal of scientific and engineering research* ,5,issue 1.

A.Sankari,K.Umasankar,(2013),Ensuring security in emergency through sms alert system, *international journal of computer applications and research*,2,487-491.

Amrit Zoad,Nadeem Sheikh, (2014), Global system for mobile communication based smart home security system, *ijera*, 4,50-55,

Md.Nasimuzzamim Chowdhury, Md.Shiblee Nooman, Srijon Sarker,(2013),Access control of door and home security by raspberry pi through internet, *ijser*, 4 ,issue 11.