HOME BASED SECURITY CONTROL SYSTEM USING RASPBERRY PI

Uppugunduru Anil Kumar[1], Patel Bhargavi[2], Nikitha Dhannawat[3], Pabbath Bharathi[4]

[1]*Asst. Professor,* [2,3,4]*B.Tech Student,ECE, Sphoorthy Engineering College, Hyderabad (India)*

ABSTRACT

Home security and automation are becoming increasingly prominent features on mobile devices. The aim of this project is to design and implement affordable, flexible and fast monitoring home security system using Raspberry pi. The system is designed to detect burglary, the image of person is captured by camera and sends to owners mobile by using camera module. The USB camera is installed at the front door of the home is interfaced with the Raspberry pi.
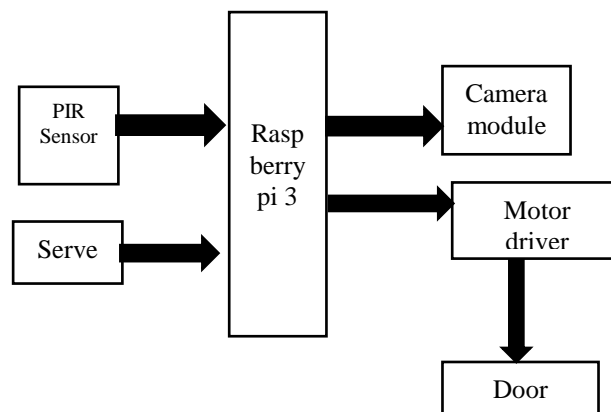
*Keywords***:** *Raspberry pi 3, USB camera, PIR sensor, Motor driver.*

I.INTRODUCTION

Security is the most important thing in human life. And people always concern about intruders or thieves when they are away from their home. In the world of Internet of Things (IOT) when we have all the technologies to protect our home, we always want a system which can be controlled and monitored from anywhere. There are many types of good systems and cameras out there for this purpose but they are much expensive so today we will build a low cost simple **Home security system**, which not only alert you through an email but also sends the picture of Intruder when it detects any.

This system will detect the presence of Intruder and quickly alert the user by sending him a alert mail. This mail will also contain the Picture of the Intruder, captured by USB camera. Raspberry Pi is used to control the whole system. This system can be installed at the main door of your home or office and you can monitor it from anywhere in the world using your Email over internet.

II.SYSTEM REQUIREMENTS

International Journal of Advanced Technology in Engineering and Science
Vol. No.5, Issue No. 03, March 2017
www.ijates.com
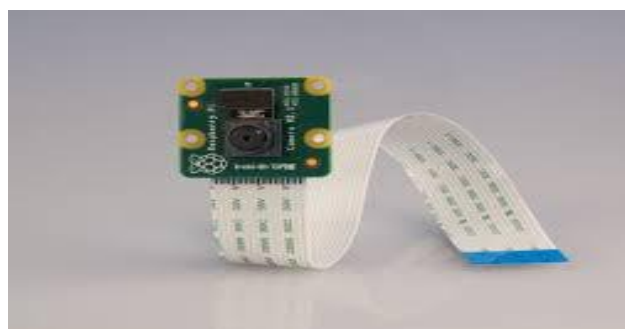
180

ijates
ISSN 2348 - 7550

2.1 Raspberry PI3

The Raspberry Pi 3 is the third generation Raspberry Pi. It replaced the Raspberry Pi 2 Model B in February 2016.It has 1.2GHz 64-bit quad-core ARMv8 CPU, 802.11n Wireless LAN, Bluetooth 4.1.As pi 2 raspberry pi3 also has some similar features like 1GB RAM, 4 USB ports, 40 GPIO pins, Full HDMI port, Ethernet port, Combined 3.5mm audio jack and composite video, Camera interface, Display interface Micro SD card slot, Video Core IV 3D graphics core.

The Broadcom BCM2835 SoC used in the first generation Raspberry Pi is somewhat equivalent to the chip used in first generation smartphones (its CPU is an older ARMv6 architecture),[14] which includes a 700 MHz ARM1176JZF-S processor, VideoCore IV graphics processing unit (GPU),[15] and RAM. It has a level 1 (L1) cache of 16 KB and a level 2 (L2) cache of 128 KB. The level 2 cache is used primarily by the GPU. The SoC is stacked underneath the RAM chip, so only its edge is visible. The Raspberry Pi 2 uses a Broadcom BCM2836 SoC with a 900 MHz 32-bit quad-core ARM Cortex-A7 processor (as do many current smartphones), with 256 KB shared L2 cache. The Raspberry Pi 3 uses a Broadcom BCM2837 SoC with a 1.2 GHz 64-bit quad-core ARM Cortex-A53 processor, with 512 KB shared L2 cache

2 .2 USB Camera

A camera module is an image sensor integrated with the lens, electronic, and an interface like CSI, Ethernet or plain raw low voltage differential signaling. The Camera Module can be used to take high-definition video, as well as stills photographs. The camera works with all models of Raspberry Pi 1, 2, and 3. The camera module is very popular in home security applications, and in wildlife camera traps.

International Journal of Advanced Technology in Engineering and Science

Vol. No.5, Issue No. 03, March 2017

www.ijates.com

181

ijates

ISSN 2348 - 7550

2.3 Motor Driver (L293D

L293D is a dual H-bridge motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors. L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction.

2.4 PIR Sensor

All objects with a temperature above absolute zero emit heat energy in the form of radiation. Usually this radiation isn't visible to the human eye because it radiates at infrared wavelengths, but it can be detected by electronic devices designed for such a purpose. The term *passive* in this instance refers to the fact that PIR devices do not generate or radiate any energy for detection purposes. They work entirely by detecting the energy given off by other objects.[1] PIR sensors don't detect or measure "heat"; instead they detect the infrared radiation emitted or reflected from an object.

PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they are commonly found in appliances and gadgets used in homes or businesses. They are often referred to as PIR, "Passive Infrared".


III METHODOLOGY

The system is based on sending the email to the mobile user. A PIR sensor is used to detect the presence of any person and a Pi Camera is used to capture the images when the presence it detected. The data is collected by the sensors is directly send to the user through Email. When an object moves within the range of PIR sensor, a signal is sent to the raspberry pi3, which initiates the webcam snaps a photo which is stored onto memory card of Raspberry pi. The stored photo is then forwarded via email to the user. The user identifies whether the person is known or unknown and gives information to the motor driver to open the door or not.

IV RESULTS

The design of the face recognition system using Raspberry pi can make the smaller, lighter and with lower power consumption, so it is more convenient than the PC-based face recognition system. Also send a security alert message to the authorized person utilities. The developed scheme is fast, highly reliable and provides enough flexibility to suit the requirements of different systems. Using raspberry pi the current project can be modified by an Infrared camera interfacing it can be used in Smart Surveillance Monitoring security system which any type of public security is using Living body detection.
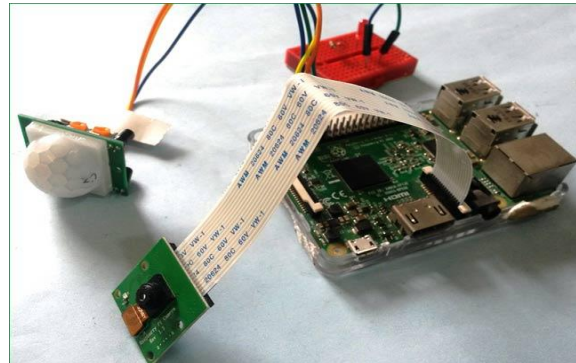
V.CONCLUSION

This paper presents the design and implementation of a low cost but secure home security system for general users. The security level is increased due to the usage of Raspberry pi which sends the images to the user, has in built capabilities and is easily connectible to external devices. Raspberry pi proves to be smart economic and efficient platform for implementing the home security system. Advantage provided by the system is that, Necessary action can be taken in short span of time in the case of emergency condition. A raspberry pi and open source applications with its ever growing community and development provides a great hope in the near future.

ACKNOWLEDGEMENT

REFERENCES

[1] A. R. Al-Ali, M. AL-Rousan,'Java –Based Home Automation System', IEEE Transactions on Consumer Electronics, Vol.50, No.2, pp. 498- 504, 2017.

[2] E. M. C. Wong, 'A Phone Based Remote Controller for Home and Office Automation', IEEE Transactions on Consumer Electronics, Vol.40, No.1, pp. 28-34, 2016.

[3] N. Shriskanthan, F. Tan, A0. Karande,'Bluetooth Based Home Automation System', Microprocessors and Microsystems, Published by Elsevier, Vol.26, No.6, pp.281-289, 2013.