

IOT Based Smart Security System Using Raspberry Pi

1 .Prof. Muzaffar Khan,2. Karishma Ramteke, 3. Pragati Tembhurne, 4. Samiksha Khobragade

¹ Professor , Dept Of Electronics And Telecommunication, Anjuman college of engineering and technology,Nagpur,India,

² Student, Dept Of Electronics And Telecommunication, Anjuman college of engineering and technology, Nagpur , India,

³ Student, Dept Of Electronics And Telecommunication, Anjuman college of engineering and technology, Nagpur, India ,

⁴ Student, Dept Of Electronics And Telecommunication , Anjuman college of engineering technology, Nagpur, India

Introduction

Abstract

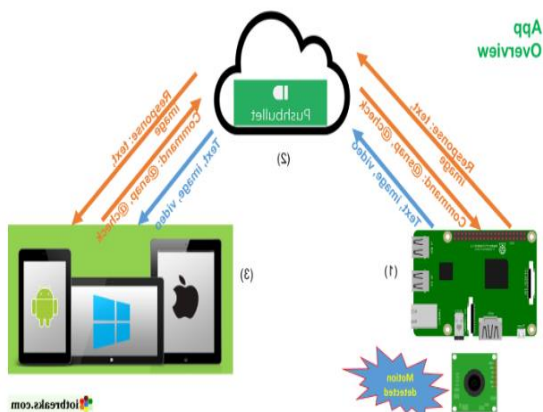
As we all know how technology is growing day by day and how it is influencing our way of living life. With all this advances in the technology we have come up with a better security system. In this paper we are proposing a security system using a raspberry pi and a camera module, which is cost efficient and easy to install as compared to that of the traditional system which are very expensive. Raspberry pi is a credit card sized computer. It itself becomes a camera security system on using its own camera board. As soon as the motion is detected it will notify the user on its android device and it supports two way communication. This system is IOT(internet of things) based system. IOT is the internetworking of physical gadgets, structures and other things that contain electronics, software , sensors, actuators and connectivity which allow these things to connect, interact and exchange data.

The surveillance means to monitor something. Security in residential complexes is restricted to limited geographical locations due to the traditional devices and process used for securing any apartment or complexes. High definition surveillance camera using is set up in the areas which need to be monitored. This system is motivation from other systems which explains similar systems with some disadvantages which is tried to be solved in this paper. It also includes some additional feature like data backup, push alert messages instead of sms schemes and it also sends captured images along with video. New technologies are included like IOT (internet of thing) based applications. The internet of things (IOT) is the internetworking of physical devices, buildings and other items embedded with electronics, software, sensors, actuators and network connectivity that enable these objects to collect and Exchange data. It is expected that by 2020, 20 billion devices will be connected with the internet. This system is built in general purpose and so area is not limited for the use

of system and include many applications where it can be used which replace existing system. It is also user friendly as if user can access the system from remotely as well as locally as per the situation. Two different controlling android applications are provided for accessing raspberry pi through command line or GUI based. In the present world where we live there are already devices, which are connected to each other and help in day to day aspects, for example wearable fitness devices, sensors which help in automatic garages, RFIDS in id cards used in universities and industries to gain and lock access. However, imagine this after a few years where billions of devices will be connected to each other including cars, phones etc. Internet of things (IOT) is a going development of the internet by which every day things objects have communication capabilities which allow them to send and receive data. It is expected to connect systems, devices, sensors which can communicate without need of machine-to-machine

Working

Application Structure



There are 3 actors play together to build up the application.

- (1) Raspberry pi & camera module as the data source that continuously scan for motion and recording video at the same time,
- (2) Pushbullet as the message-broker to send messages (text, still image, and videos) back and forth between raspberry pi and mobile/web
- (3) mobile/web acts as “notifyee” who receives the still image and video of motion. The communication is two ways though. It means you can send a command from mobile or web to raspberry pi for particular action such as “@snap” (for instantly take a photo) or “@check” (to get current system information of pi).

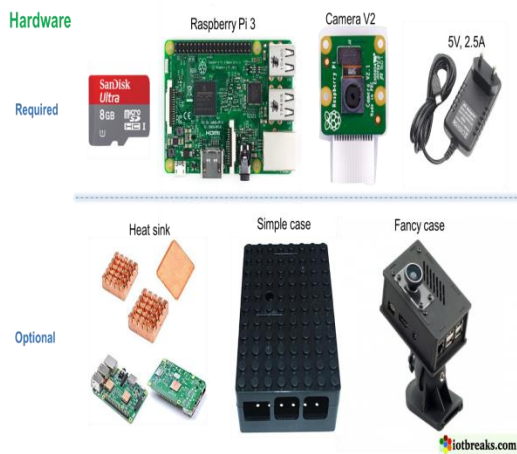
Component



fig . camera

Hardware

- 1. Raspberry Pi 3
- 2. Camera Module V2
- 3. Sandisk Micro SD card 8GB
- 4. Power Supply 5V, 2.5A
- 5. Optional: Heat sinks
- 6. Optional: Simple case or Fancy Case



Technical specification

PROCESSOR

- Broadcam BCM2387 chipset
- 1.2GHZ quad core arm cortex-a53(64 bit)
- 802.11 b/g/n wireless LAN and bluetooth 4.1(bluetooth classic and le)
- IEEE802.11 b/g/n wifi protocol: web, wpa, wpa2, algorithms CCMP (maximum key length of 256 bits), the maximum range of 100 meters.
- IEEE 802.15 Bluetooth, Symmetric Encryption Algorithm Advanced Encryption Standard(AES)
- With 128 bit key, the maximum key range of 50 meters.

GPU

- Dual core video core iv @ multimedia co- processor. Provide open gles 2.0, hardware accelerated open vg, and 1080p30 h.264 high profile decode.,
- Capable of 1.5GTEXEL/s or 24GFLOPS with texture filtering and dms infrastructure.

Memory

- 1GB LPDDR2

Operating system

- Boot from microsd card , running a version of the linux operating system or window 10IOT

DIMENSION

- 85*56*17mm

POWER

- micro USB socket 5v1,2.5a

CONNECTORS

Ethernet

- 10/100 baset ethernet socket

Video output

- HDMI (rev 1.3 & 1.4)

Audio output

- Audio output 3.5 mm jack

HDMI

- USB 4*USB 2.0 connector

Camera connector

- 15 pin mini camera serial interface(CSI2)

Display connector

- Display serial interface 15 way flat flex cable connector with two data lanes and a clock lane .

Memory card slot

- Push/pull micro SDIO

Conclusion

The smart security system has been aimed to design a such a way that it can meet the needs of the user for surveillance area. It has countless applications and we can use it in different environments. For instance ,at one

scenario it can be used by any person working in office to aware of the activity being happened at their own working places, in their absence, while at another instance it can be used for spy purposes at bank lockers, storage houses. Another application is to provide information to the user about what is happening in surveillance area by notification.

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