

EMBEDDED SURVEILLANCE SYSTEM USING PIR SENSOR

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Abstract- In this the generation the people through out of the world is facing common problem is home , bank , offices, ATM theft. And also murders , smuggling , happens around in our society. Surveillance is very important and useful to play according to 20th century. Because the biggest crime around in big cities. And its happens routine to control and find the criminal activities, the usage of surveillance to watching over and tracking people from a distance by the using of electronic equipment like as a CCTV cameras. Thus we have a designed Embedded Surveillance system using PIR Sensor and Raspberry pi. Those components are using this project PIR SENSOR to detect the motion and the find the person. And raspberry pi device using the capable of capturing images , recording video, and the send information through out an email by the user having an email in the python environment.

Keywords; Raspberry pi, Raspberry pi camera, PIR Sensor , python.

INTRODUCTION:

The security is a scenario in which objects, animals or people are provided with unique identifiers and the ability to transfer data a over a network without requiring human to human interaction. Security is the communication of anything with any other the communication mainly transferring of use table able data , for example a sensor in a room to monitor and control the temperature. Exciting is sensor less capturing system based on raspberry pi based controllers. We can't able exact motion without PIR Sensor. So we have to designed the embedded surveillance system based on PIR sensor and raspberry pi. It can also find the persons located the persons with help of the infrared sensor. And we can able to detect , recognize, Tracking system using Raspberry camera captures the information and send it throughout to the email automatically to an user by using the python environment. We can able to alert the people using the IOT technology.

SURVEILLANCE SYSTEM :

Surveillance System is the Detection and tracking of moving objects. An extra measure of security used in security system many places. used in security systems and with good reasons and the same time improve the security of people , buildings and valuables. Electronic equipment, such as closed-circuit television (CCTV),[1] Surveillance is very useful to governments and law enforcement can also used inside

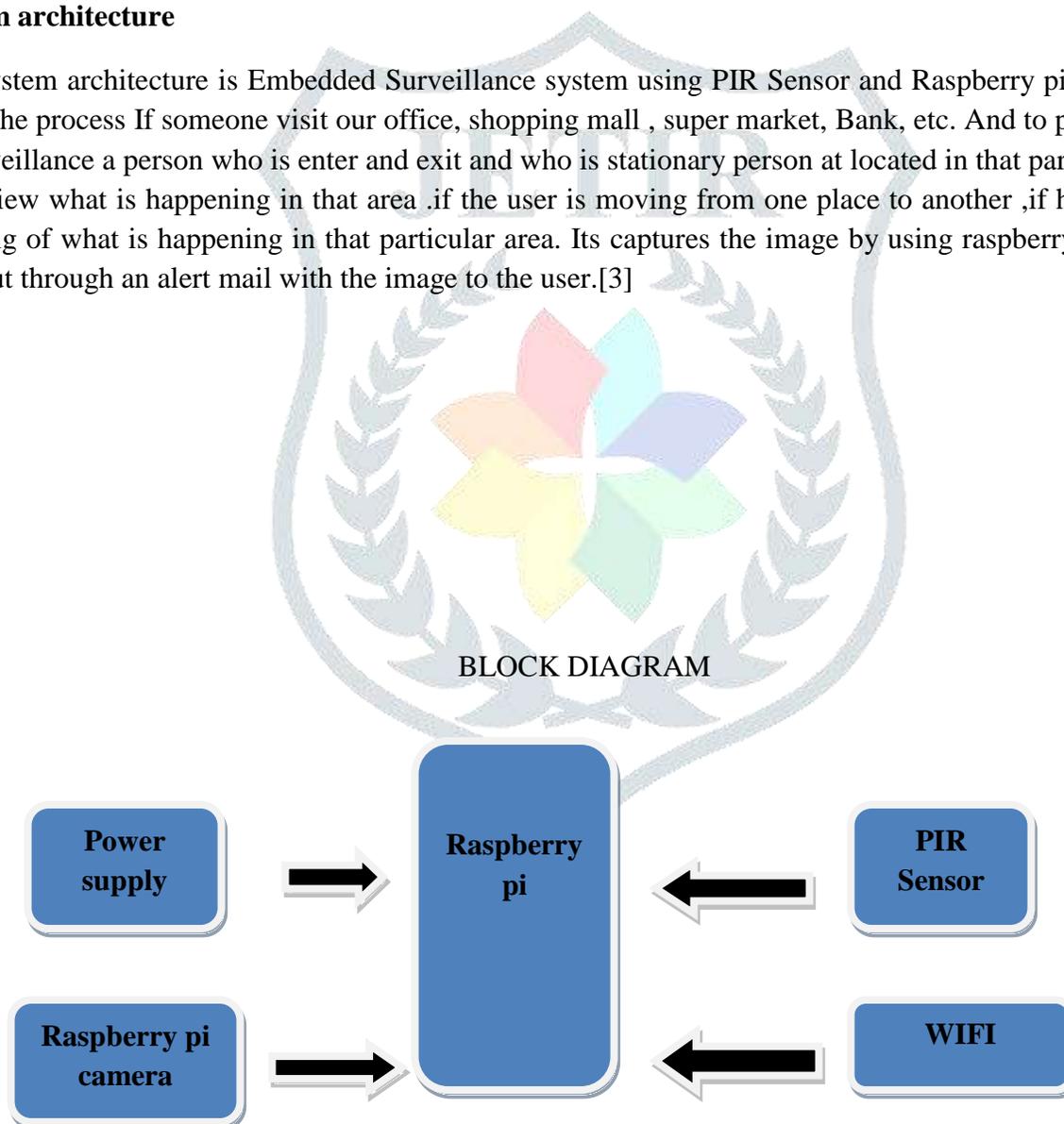
and outside schools and private residences , Monitor threats and prevent investigate criminal activity provide critical evidence for police . to reduce the traffic congestion on highways. In keep track of your employes performances[2].

Advantages of Surveillance :

- Remote control is possible
- Can share data between others
- Can monitor whatever from this world

System architecture

The system architecture is Embedded Surveillance system using PIR Sensor and Raspberry pi and its system using the process If someone visit our office, shopping mall , super market, Bank, etc. And to provide security to surveillance a person who is enter and exit and who is stationary person at located in that particular area can only view what is happening in that area .if the user is moving from one place to another ,if he/she can keep tracking of what is happening in that particular area. Its captures the image by using raspberry pi device and sent out through an alert mail with the image to the user.[3]



Block diagram Fig (1)

Hardware requirements

- Raspberry Pi 4
- Raspberry camera v2.1
- PIR Sensor
- SD Card
- Connecting Wires

Raspberry pi 4

- Raspberry pi 4 is a little single board computer and tiny credit card sized device. With so many uses the surveillance applications and security system. And the released June 2019 the various function also used in raspberry pi and the components are SD Card Plot, Micro USB Power Port , GPIO, HDMI . Quad – core arm CPU that doesn't support all the same instructions as a desktop or a laptop x86 CPU a single gigabyte of RAM 4 USB 2 ports one HDMI port and Ethernet jack a micro SD slot for storage wireless and Bluetooth and a three –and –a –half millimeter combined video. But the 40-pin general purpose input and output or GPIO which allows you to connect the PI everything from weather stations to robots.

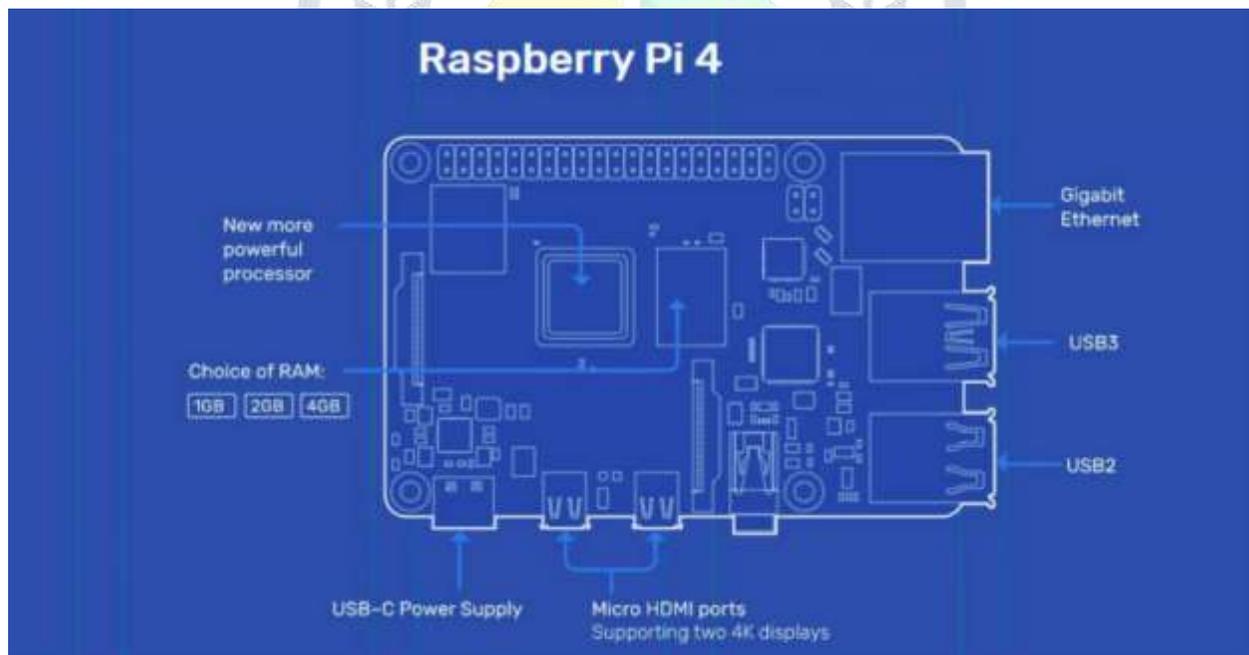


FIG (2) Raspberry pi 4

Raspberry pi 4 :

Raspberry pi camera is the high quality to use this project and captures the image and recording video and their send through out an user having an email. And the megapixel Sony IMXEL219 image Sensor custom designed on the board of raspberry pi camera . in terms of still images the capable to storing and featuring fixed focus lens.



Fig (3) Raspberry pi camerav2.1

SD Card format

In this project we use SD Card format. Those SD Card that are 32 GB or less come formatted as FAT32. Cards above 64 GB are formatted to ex FAT file system.[4] If you are formatting SD Card using Raspbian.OS , choose storage and formatting the SD Card all the files and the captures the information and store it transmits it.

PIR SENSOR

PIR Sensor (**Pyroelectric infrared Sensor**) is an electronic sensor and infrared (IR) light radiating from objects or human in its field of view. the normal sensor emit the radiation but in this sensor detect the radiation . Every living body emits some low level radiations and the hotter the body, the more is emitted radiation. Detection range of sensor is 3m to 7m approximately. In order to shape the Field Of View (FOV) of the sensor, the detector is equipped with lenses in front of it.[5]

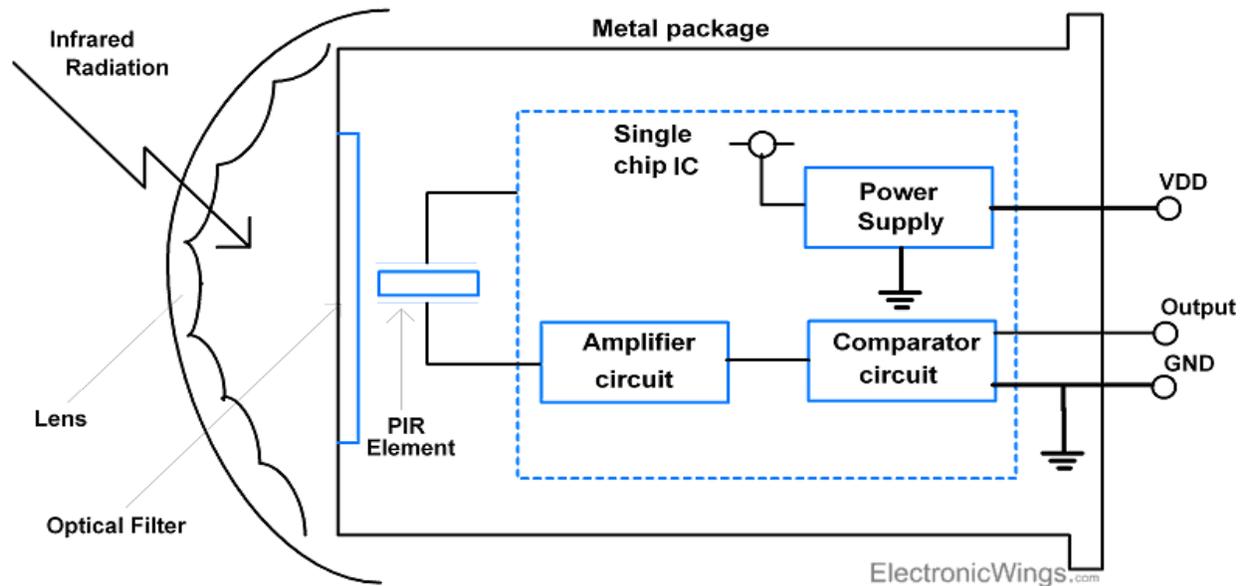


Fig (4) PIR SENSOR



Software requirements

- Raspberry pi .os
- Python
- MobaXterm

Raspberry pi.os

- **Raspberry pi os** In this project we use software Raspberry Pi. Os According to my project and our operating system the raspberry pi image in my case is windows. After that open the installer and install the software and choose the operating system raspbian lite only for console work after the selecting the operating system I will select SD card is selected click on write the entire operating system and creating two files to connect our wifi system.



Fig (5) Raspberry pi .os

Python

Python programming language. The total programming is developed in Python which includes some python packages, the program includes capturing the image when motion detects, saving the image and send it. to the user and also sending the data to Thing speak. The Python packages include configuring GPIO, I2c set up, and installing python smbus, smtplib.[6]

Python 3 for Programming the Surveillance Security System logic and Functionalities.



Fig (6) Python software

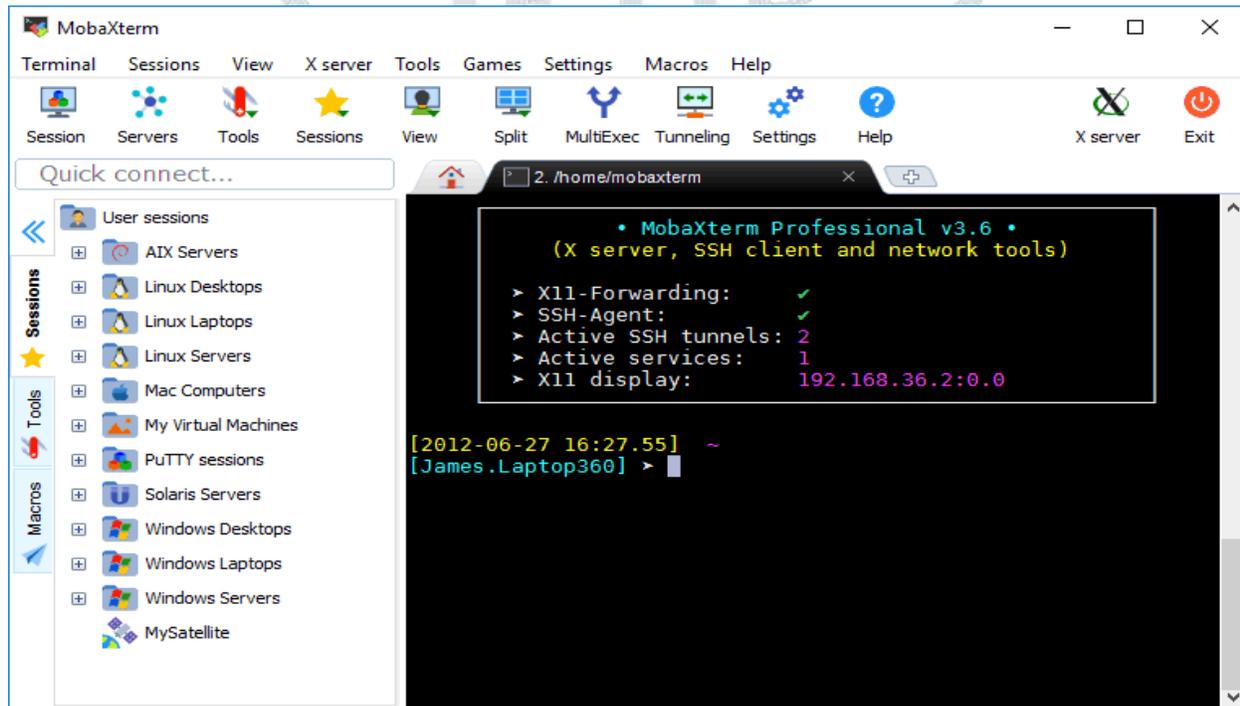
Mobaxterm

Mobaxterm is used by the SSID and IP Address and WIFI to access the raspberry pi and their device to able connect our WIFI SYSTEM



Fig (7) mobaxterm

In the mobaxterm to select SSH id and to operates our WIFI system and security system and the protect it.



Fig(8) mobaxterm

Circuit diagram

- vcc 2
 - gnd 6
 - data 11
- these pins are connecting wires to the raspberry pi usb port to pass through Alert message to that particular mail.

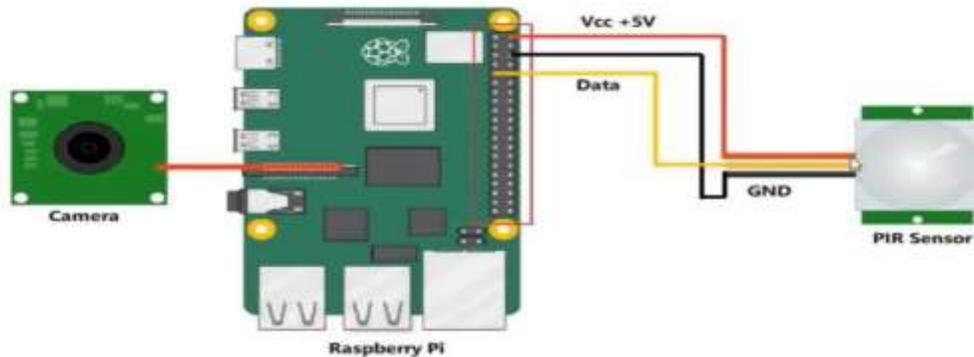


Fig (9) Circuit diagram

Flow chart processor

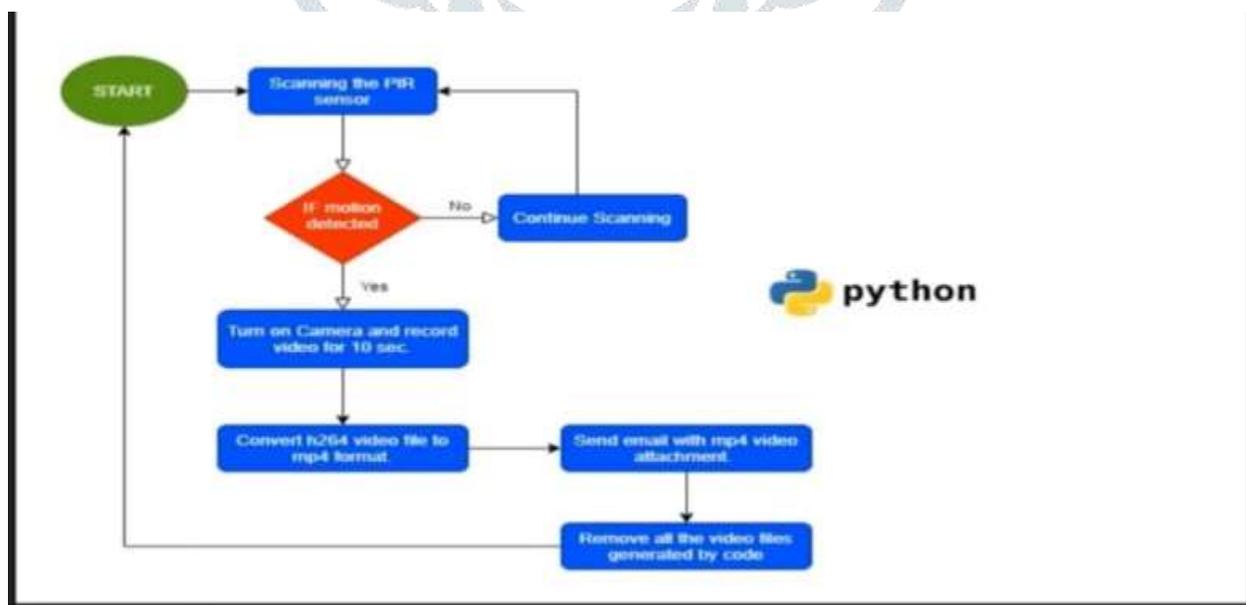


Fig (10) Flow chart process

Conclusion

To Secure the today's Embedded Surveillance system using PIR sensor against the home theft , murders, smugglers. The main purpose of this project is surveillance technologies have to the potential to exponentially increase our ability to detect the investigate and law enforcement to find criminal activities and reduce the loss, Theft and vandalism. the main advantages of surveillance to detected the person of face recognition are used to public places and private places to identify the person. In the future we don't need man security to protect our offices, homes , ATM etc.

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