Surveillance system with low data storage

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ABSTRACT

In the present day scenario the security forms the most important part of our life.
Door opening and closing have been always boring job, especially in shopping mall, hotels, commercial building where a person is required to open the door for visitors. Here is a solution to open and closing the door i.e. movement sensed door opening and closing.
This project is used to sense human body movement near by the door. This is achieved by the PIR sensor.
We are making entrance beam with PIR sensor , when any human will be pass through it then PIR sensor accept the infrared energy which is emitted by human body thus door will open and camera capture the image of human. If any non-human will be passing through this beam then door does not open.
It will require low storage because we stored only captured image instead of live streaming.

Keyword: - *USB camera, PIR sensor, Raspberry pi3 model B, Buzzer, Smart phone, DC motor, power supply.*

1. INTRODUCTION

The proposed system is based on concept of "low data storage" using raspberry processor. Now a day everything is automated then why we use human for opening and closing a door thus we are making automatic door opening system. This project is use to sense any body movement near by the door. This is achieved with the help of PIR sensor. This signal which is detected by PIR sensor is fed to processor to functional door motor through motor driver IC [1]. If human is detected by PIR sensor then LCD screen displayed a massage 'Human Detected' and send the signal to the processor than processor sand request to camera to capture the movement.[2] store in given storage and raspberry pi is a computer size of a credit card that has the capability to become a camera security system when camera is used to contains all the essential software to include motion detection which enables camera to detect movement and save only the image, thus it requires low storage[5] and gate will be open 90 degree for short duration. This system is only for human detection purpose.

1.1 Block diagram

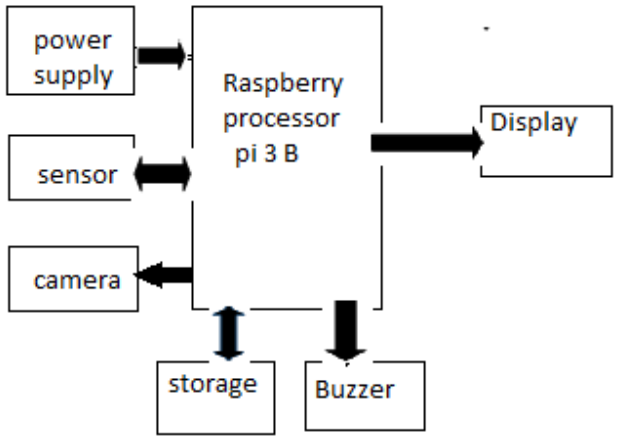


Fig. block diagram of surveillance system with low data Storage

The block diagram of surveillance system with low data storage shown in fig 1.This system consist of various parts such as Raspberry pi, PIR sensor, camera, display, USB storage, buzzer, power supply. The power supply is most important for every circuit, which provide electric supply to the processor and other devices.

Raspberry pi is a heart of system; it is used for ON/OFF camera and PIR sensor. It can be used in various applications such as remote control; automatic door opening system, raspberry pi is low cost, low power, high availability & reliability module. It uses 5v power supply. It is 40 pin extended GPIO and 4xUSB 2 ports and 4 hole stereo output and composite video port.

PIR sensor are used to detect any motion. It will able to sense Infrared energy radiated by human body. Whenever it detects any human body in its range then binary value '1' is sent to RPI, else binary value '0' is sent. It works on 5v, 30mA current. Ideally, it senses motion up to 12ft, i.e. 4 meter in hemispherical angle.

Camera is used to capture the images. Camera used in system is 8-12MP. It can be connected to the Raspberry pi board through serial/flex cable. Captured image can be stored in the form of JPEG, PNG, and BMP etc. Camera operates on 3.3V. Buzzer is used to alert the surrounding. This system uses DC buzzer which operates on 5V and 30mA. It has sound pressure level of 85dB. This DC buzzer has 2.3 kHz frequency. It operates in continuous mode. Monitor is use to display the image.

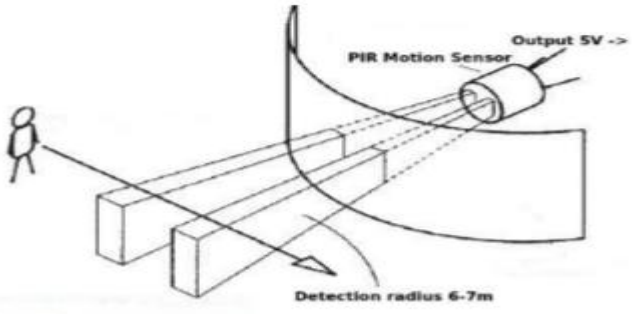


Fig. working of PIR sensor

1.2 General system flow chart

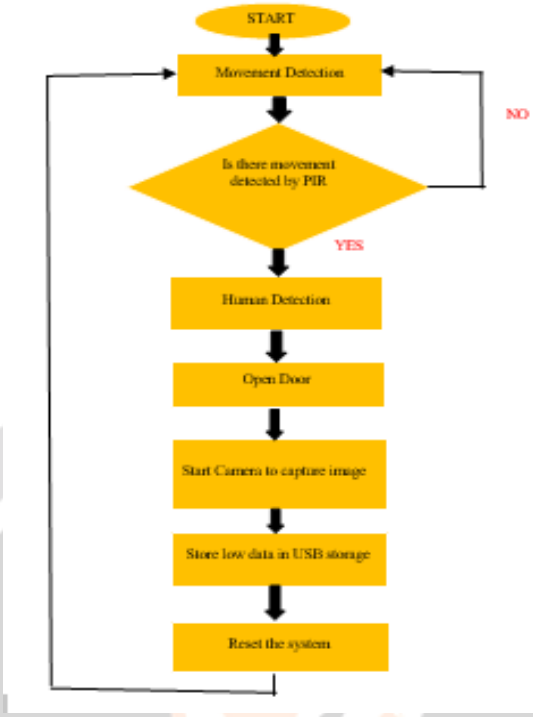


Fig. Flow chart

2. SOFTWARE REQUIREMENT

2.1 Python

Python is open source, high level programming language which is used for general purpose programming. It is also known as most widely used interpreting language. It has great feature of code readability. White spaces are used to delimit the blocks instead of using curly braces. In python syntax is designed in such a way that only fewer lines of code are enough to explain the concept. It supports late binding by binding variable and method name at runtime. Python is a powerful modern computer programming language. It bears some similarities to FORTRAN, one of the earliest programming languages, but it is much more powerful than FORTRAN. Python allows you to use variables without declaring them (i.e., it determines types implicitly), and it relies on indentation as a control structure. Python was developed by Guido van Rossum, and it is free software. Free as in "free beer," in that you can obtain Python without spending any money. But Python is also free in other important ways, for example you are free to copy it as many times as you like, and free to study the source code, and make changes to it. There is a worldwide movement behind the idea of free software, initiated in 1983 by Richard Stallman.1 This document focuses on learning Python for the purpose of doing mathematical calculations. We assume the reader has some knowledge of basic mathematics, but we try not to assume any previous exposure to computer programming, although some such exposure would certainly be helpful. Python is a good choice for mathematical calculations, since we can write code quickly, test it easily, and its syntax is similar to the way mathematical ideas are expressed in the mathematical literature. By learning Python you will also be learning a major tool used by many web developers.

2.2 Raspbian OS

Raspberry Pi uses an operating system which is based on Debian Operating System known as Raspbian Operating System. It is the interface which has set of basic programs and utilities which enables Raspberry Pi hardware to run. Raspbian Operating System uses optimized Debian OS which is recommended by Raspberry Pi foundation over other operating system.

Raspbian OS has following versions:

1) Raspbian Noobian

2) Raspbian Wheezy

3) Raspbian Jessie

Raspbian Wheezy supports Command line interface as well as graphical user interface. It supports Debian multimedia which deals with audios, midi and graphics, video. It also provides own cloud interface for storage purpose, it can be accessed through web. It uses Linux Kernel version 3.16 and GCC 4.9.

2.3 Steps to install Raspbian OS

In order to install Raspbian OS, first next out of box software (NOOBS) has to be installed.

- First step is to allocate the drive for installing OS
- SD adaptor can also be used for this purpose
- Download WINDISK 32 utility from source forge project which is a zip file
- Extract and run the zip file
- Select the file and click run as administrator
- Select the image file which was extracted above
- Select the drive letter of the SD card in the device box
- Click writes and wait for write process to complete
- Exit the image and eject the SD card

2.4 Steps to install PUTTY software

- Obtain a copy of PUTTY pre-configured for use at Columbia from the PUTTY download page.
- Save the installer file to your download directory or desktop.
- Exit all applications before you begin the installation process.
- Double click on the file PUTTY install.exe to begin the installation.
- At the choose destination screen, click Next to accept the recommended default destination location for installing PUTTY.
- Click next on the select program folder screen to select PUTTY as the recommended program folder name.
- Click finish on the final screen to complete the installation.

3. Working

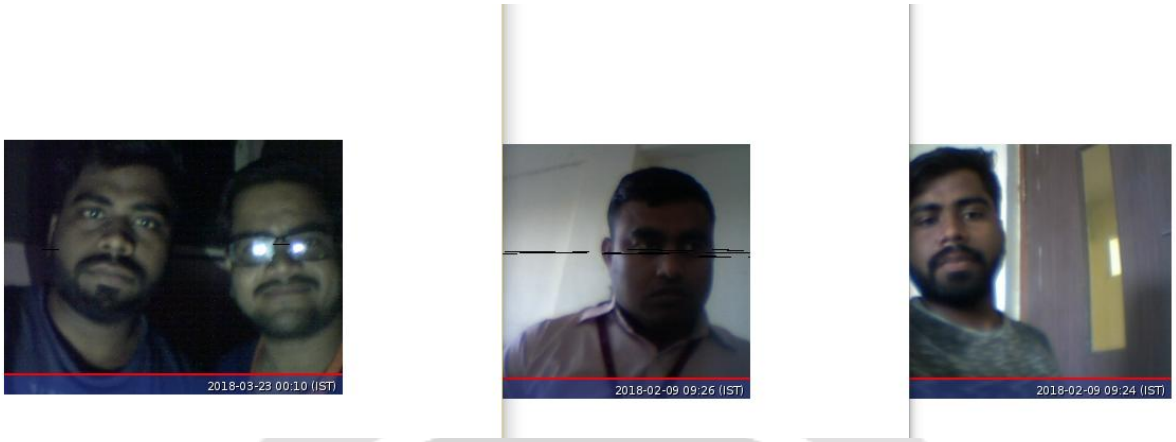


Fig: captured images

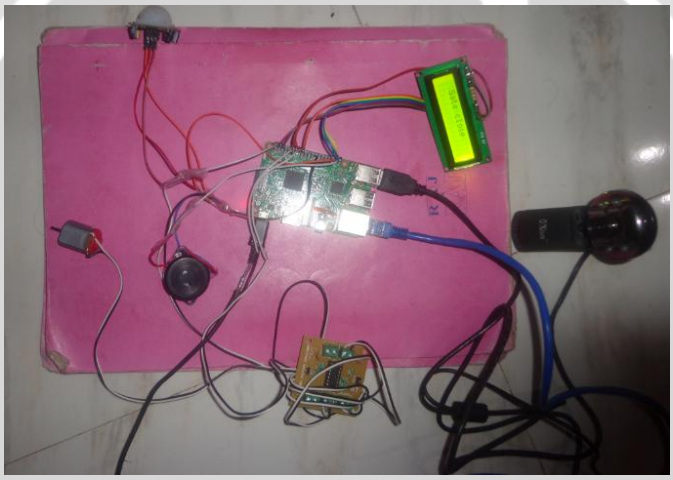


Fig: working module

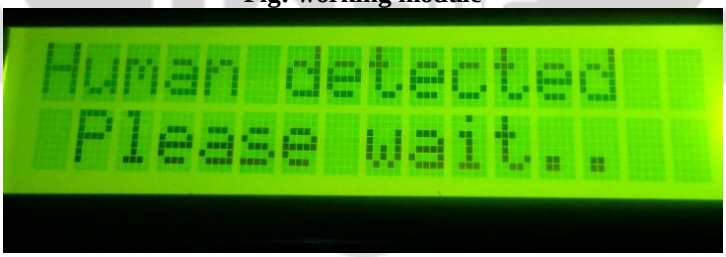


Fig: LCD screen

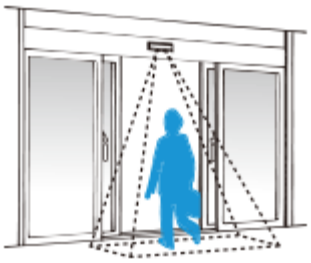
The above images show presence of human. PIR sensor detect the motion, and further system functioning is carried out. After motion sensing, buzzer starts ringing and camera capture image of human object.

3.1 Entrance beam

In this type of surveillance system we are making a entrance beam to passing the human as shown in fig. the PIR sensor is connected at the top of beam to detect human body.

The PIR sensor is used because it sense the infrared energy which will be emitted by human body, this infrared energy will be detected by PIR sensor and send signal to the processor.

If human is detected then LCD screen will display the massage “HUMAN DETECTED”.



The door is kept open while objects are detected by the reflection of infrared rays.

Fig- Entrance beam

4. CONCLUSIONS

Thus we have designed a surveillance system with low data storage capable of capturing images and store its own storage this is proposed system uses a PIR sensor to sense the human body movement near to the entrance beam. Generally a human emits infrared energy in the form of heat which is detected by PIR sensor form a particular distance. Then the sensing signal is fed to processor and buzzer will be alert and it shows there will be human or non-human. It is advantageous as it offers reliability and privacy on both sides. It offers only one person concerned to view data.

5. REFERENCES

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