



IoT Based Anti Theft Flooring System

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Abstract:

Recently security matter have grown tremendously, it is necessary for all to be able to safeguard their property from all worldly harms such as theft, destruction of property etc. As the technology is rising, the methodologies which are used by thieves and robbers are also equally improved in stealing. To Monitor and to investigate we use CCTV cameras. In monitoring, CCTV camera is expensive because of the use of a computer. It takes too much space for continuous recording and it also need manpower to discover the unauthorized Activity. Compare to actual System Raspberry Pi is much reasonable with better resolution and low power utilization features. This Project "IoT based anti theft flooring system using Raspberry Pi" where we will use image processing on live video to identify theft using motion and also feature the area where the act occurred. Image is send through IoT(on 'Gmail account of owner').Technology has reached a stage where mounting cameras to capture video imagery is cheap, but finding available human resources to sit and watch is imagery. In this system, we use a camera along with raspberry pi along with a circuit with LCD display IR for night vision and cloud for storage. As soon as camera gesture is detected in camera, the network uses image processing to detect an exact area of incident and highlights it accordingly.

Keywords: Raspberry pi, PIR sensors, camera, USB, Buzzer.

I. INTRODUCTION

IoT based antitheft flooring system is a system which is made for maintaining the security. it is a smart device for security purpose. This is a smart monitoring system, it is a device which is made for the security purpose. The main objective of this project is to make a smart monitoring device which monitors the area in which it is implemented. this device is installed in that area where no one is permissible to enter except the authorised persons. Only those people are allowed to enter who are authorised in that particular area. if any unauthorised person enter in that field than this smart device will capture the face of that person and if that person is legal then it is ok and if not then the buzzer of this will gets on and it sends an alert message to the owner of that place. In this device a camera is used and to make it smart different sensors are used like PIR sensors along with raspberry pi, for the sound purpose a buzzer is used and for the storage purpose cloud service is used. USB also plays a very important role because the captured images are going to be saved there only and it saves the images and along with the basic details of the legal persons like its name, address, mobile number. Some legal persons details are already will be there so that when a legal person enter into that particular area the camera will capture the image and though devices it matches that images and when match found the buzzer will not make noise. This system is based on the concept of IOT(internet of things) and these types of technologies are implemented for the better security purpose. By using this the security of that place will become stronger. This smart system should be installed everywhere the security will get stronger.

II. OBJECTIVE

If we talk about our country, INDIA. Most of the crimes occurs in big shops, jewellery shops, houses etc. all these places are implemented with a CCTV camera only and no any other security is provided to that shops. in that case most of the crimes are held and owners of that shops have to suffer from a big loss and the police catch those criminals after so many days or after many months or we can say crimes are

usually found out after it is being committed. Crime rate is also increasing very rapidly and after looking all this I have decided to make smart monitoring system that is IOT based anti-theft flooring system. The main objective is to make this it will detect crime or any unnecessary actions that are performed and required actions will be taken at instant only. So that owners don't have to worry about their assets and their assets will be safe from stealing. It captures an image when any motion is detected is prevented in secured areas.

It provides:-

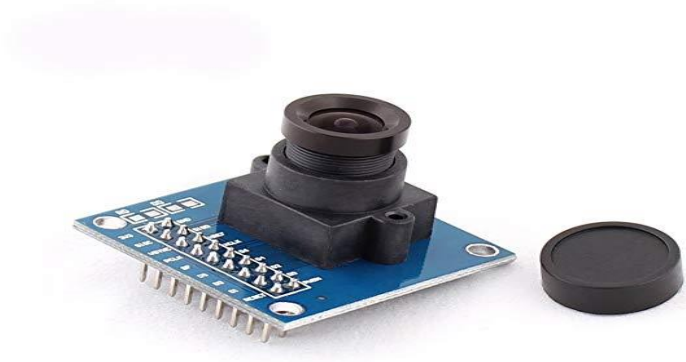
- 1. SAFETY-** if a person is not present in the shop then this device will provide security to the shop. This smart device will protect the whole shop even an absence of the owner. This device will take care of all the assets.
- 2. RELIABILITY-** This system will take less electricity. so that it works on both AC and DC current. This system will take electricity as normal as other electronic devices use but if there is no electricity then additional battery backup is provided to keep the system in working mode. In this monitoring system the power consumption is very less.
- 3. PROOF-** it is the most important factor whenever a crime happens. Camera will take images of the unauthorised person and it saves it into storage device so that afterwards the further investigation can happen. Camera monitors all the things which were happening there it took images and the raspberry pi gives the signal to the buzzer so that the buzzer will starts beeping.
- 4. CHEAP-** to implementing this device the cost will be very low or according to that what type of devices you are using to implement this that electronic devices can also be cheap or not.

III. IMPLEMENTATION OF THE FRAMEWORK

1. CAMERA:

- It will be installed in the hidden area. so that unauthorised person will not see the camera.

- Camera will monitor all the things which are happening there.
- Camera will be connected to raspberry pi so that the captured images will go there.
- In this system, Roboto 640*480 VGA CMOS (Complementary Metal Oxide Semiconductor) camera is used.



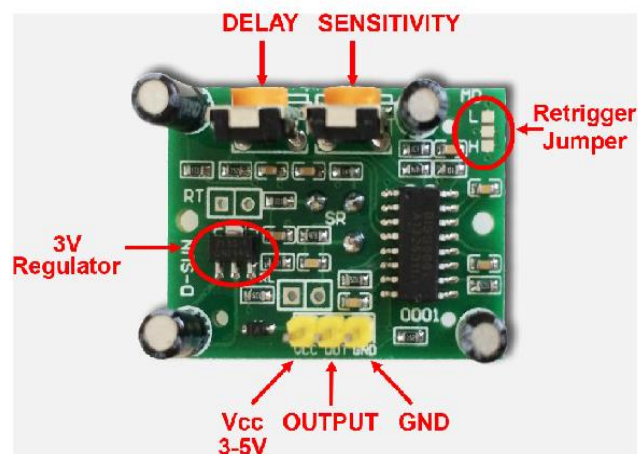
2. PIR sensor:

- It stands for Passive Infrared Sensor.
- Also known as motion detector.
- It is used to detect the presence of a human being.



Front view of PIR sensor

- It detects the presence of human from a distance of approx. 12 meters.
- Its sensitivity is high for detection.
- It requires minimum electricity of 5volts.
- This is also connected to Raspberry pi.



TOP view of PIR sensor

3. Buzzer:

it is a very small device connected to Raspberry pi.

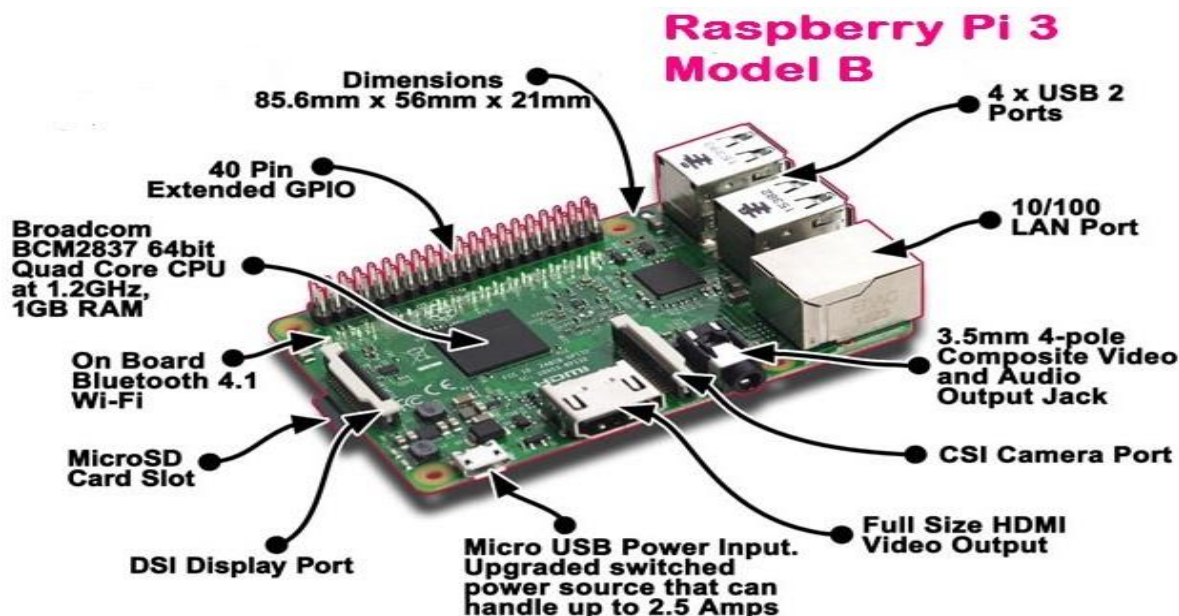
- It is an audio signalling device.
- The buzzer will get on whenever it receives signal from the raspberry pi.



4. Raspberry pi:

it is the most important part of this project because all the things like camera, sensor, buzzer etc. all are connected to this.

- In this system Raspberry pi 3 model B has used.
- It has 40 pins.
- It has 26 GPIO (General purpose input/output) pins.
- It has 4 USB 2.0 ports.
- 1GB RAM.
- CSI camera port for connecting raspberry pi camera.
- It is power efficient.
- It acts as a server, it receives input from PIR sensor.
- Captured image is stored in raspberry pi



IV. WORKING

In this system Raspberry pi, USB, Camera module, Buzzer, PIR sensor is used. In this the raspberry pi has been used as the heart of the system.

The camera continuously checks the status of that particular place by camera and sensor. Person is entering is checked by the PIR sensor and if the person is an illegal then it sends a notification to the owner through message or e-mail and the buzzer will starts beeping. Camera continuously sends an image to the owner.

That what is happening there?

This system is mainly made to give the protection to the expensive things or to protect an asset from stealing.

This system takes less electricity to work and also it works on the simple manner.

Simple algorithm to understand the working.

Step 1) All the devices are on and all small devices are connected to raspberry pi.

Step 2) one person enters into that particular area, where it is installed.

Step 3) if the person who entered into that area will be known by the PIR sensor and the camera start monitoring the things.

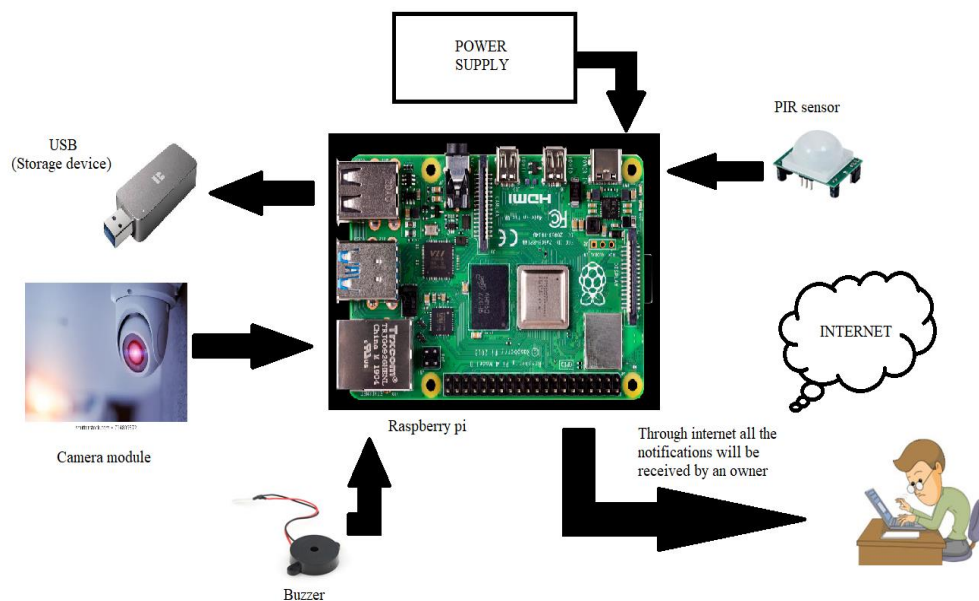
Step 4) if the person who entered into that area is authorised, then it is ok.

Else (unauthorised)

Then the camera will send the signals to the raspberry pi and the owner starts receiving the notifications and the buzzer starts beeping.

Step 5) through this the unauthorised person will not able to steal any asset.

V. PROPOSED FRAMEWOK



• Power supply is given to raspberry pi.

• USB, PIR sensor, camera module are connected to raspberry pi.

- Camera module is responsible for the monitoring which is going on a particular place.
- If, an illegal person is present at that place then camera will capture all the things and it sends signals to raspberry pi and raspberry pi sends notification through e-mail or message to the owner

ADVANTAGES

- By installing this we can secure the things.
- Security of many places like banks, museum and of jewellery shop will be high.
- Crimes will be less.
- It also works as a informer of the owner.
- In this system, only one time investment is there and your things will get secured.
- This device is free from hacking.
- Once it is installed it will work for many years.
- The chance of hacking is very less.
- Very less electricity is needed.

DISADVANTAGES

- To install this device, one professional is needed.

- Regular maintenance will be there. Like sometimes in this smart monitoring system some small device will not be in a working condition. So, you have to buy a new device.
- This monitoring system should be regularly checked because may be crime is happening and camera is taking images continuously and the camera is giving negative signals may be the buzzer will not at that time. So, the entire system is of no use.

EVALUATION

There are 3 steps for our program:

Step 1: To detect the face. Given an image we want to detect which part of our image is face.

Step 2: To generate the labels for the training data and then training our classifier.

Step 3: To predict the face. So given an image we want to predict whose face is it. For that we need to install two dependencies: open cv and numpy.

After that we will install both these via anaconda. In this way we can get the latest version of python so that it does not mess with system libraries.

There are three folders numbered 0,1 In 0 random images of people are there then in folder 1 all the testing images are there and in folder.

There are some random images and original pic:

TOTAL IMAGES	Correct images	Wrong images	accuracy
40	30	10	75%

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