

# **SMART RECEPTIONIST WITH SMARTLOCK SYSTEM**

Submitted in partial fulfilment of the requirements for the award of

## **Bachelor of Engineering Degree in Electronics and Communication Engineering**

BY

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**SCHOOL OF ELECTRICAL AND ELECTRONICS**

**SATHYABAMA**

**INSTITUTE OF SCIENCE AND TECHNOLOGY**

**(DEEMED TO BE UNIVERSITY)**

**Accredited with Grade “A” by NAAC**

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**APRIL 2021**



# **SATHYABAMA**

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**DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING**

## **BONAFIDE CERTIFICATE**

This is to certify that this Project Report is the bonafide work of **VENKATA RAGHAVENDRA KALYAN (37130211), M.SANDEEP (37130256)** who carried out the project entitled **"SMART RECEPTIONIST WITH SMARTLOCK SYSTEM"** under our supervision from January 2021 to March 2021.

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## **DECLARATION**

We **VENKATA RAGHAVENDRA KALYAN (37130211)** and **M.SANDEEP (37130256)** hereby declare that the Project Report entitled “**SMART RECEPTIONIST WITH SMARTLOCK SYSTEM**” is done by us under the guidance of **Dr. V. VIJAYA BASKAR M.E., Ph.D.**, is submitted in complete fulfilment of the requirements for the award of the degree in Bachelor of Engineering in Electronics and communication Engineering.

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**PLACE : CHENNAI** 2.

**SIGNATURE OF THE CANDIDATE**

## ACKNOWLEDGEMENT

We are pleased to acknowledge our sincere thanks to Board of Management of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. We are grateful to them.

We convey our thanks to **Dr. N. M. NANDHITHA, M.E., Ph.D.**, Dean, School of Electrical and Electronics and **Dr. T RAVI, M.E., Ph.D.**, Head of the Department, Department of Electronics and Communication Engineering for providing us necessary support and details at the right time during the progressive reviews.

We consider myself most fortunate and immensely privileged to have worked under the guidance of **Dr. V. VIJAYA BASKAR, M.E., Ph.D.** Professor, School of Electrical and Electronics to complete this project successfully.

We express our heartfelt thanks to our family members and all our friends who helped us to complete our project successfully & finally, we thank the exciting super natural power, the almighty for being with us all through my life.

## **ABSTRACT**

Today we face security issues in each angle. So we attempt to determine these issues by utilizing refreshed innovation. During this task, we are utilizing the Face acknowledgment module to catch human pictures and saving in a data base. Assuming it Image matches with the data base then door will be opened by an electromagnetic lock with help of dc motor. The use of face recognition system that's accurately detect all unauthorized users from highly secured areas and aids in minimizing human error. Face recognition system is one of the most high security system when compared with finger print locking system and also password based security system. The time and accuracy factor is taken into account about the main problem which specifies the performance of automatic face recognition in real-time environments. Presented here may be a security system that allows you to see a visitor while EFY Tested your headquarters door is locked. If you're within the middle of a meeting in a conference room and there's a visitor at the door, this technique will send a notification to your smartphone with a photograph of the visitor as email.

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## **LIST OF ABBREVIATIONS**

|     |   |                    |
|-----|---|--------------------|
| HD  | - | High Definition    |
| IoT | - | Internet of Things |
| IR  | - | Infrared           |
| NC  | - | Normally Closed    |
| SoC | - | System on Chip     |

## **CHAPTER 1**

### **BACKGROUND OF STUDY**

Security have propose different favored methodologies that to expand biometric and secret key security. In any case, method Evolving and developing with the utilization of different of gear. Pattern moved from finger impression to confront Recognition. That is the reason we favor Face Recognition System. Open the entryway Facial acknowledgment is generally utilized in different Industry and Corporate Sector. This entryway opening framework for the most part utilizes facial acknowledgment. The most recent camera is utilized to recognize pictures and pictures are Sending to data set. Assuming the picture coordinates with the manager the picture is, opened utilizing the IoT application. In this day and age we are addressing our requirements by utilizing brilliant gadgets shrewd. Following patterns and updates, we need to consider and Remove provisos in existing framework and add more highlights and updates. Face discovery is more unpredictable because of the framework flimsy attributes. Model: Let us consider glasses and Beard will show some impact for face recognition. At that point by consider various pictures of various points and faces and this will influence the identification interaction.

The investigation of Open CV and its inbuilt library capacities assists with producing a code with the privilege and legitimate facial acknowledgment framework Newer and more effective utilization of equipment. Human face will be caught live and distinguished as a contribution inside the climate picture and interaction from a web camera will catch every one of the pictures in an edge. Pictures will go through raspberry and check with pi3 regulator and the set aside data base, for the present circumstance, used a 8 GB memory card. Conglomeration communication will be done In VNC watcher that helps with

running Rasp bian OS more The response will be delivered off the smaller than usual controller that is added to it.

This little controller is furnished with a Zig bee recipient and power transformer and a support are related with this scaled down controller and show board are in like manner related with it. Will do it Control the driver to bolt and open the doorway to run. This model is an alternate calculation where we have taken open cv Because it will give more precision results when looking at For different calculations. By this, we can say that opening or remains bolted the entryway Face recognition is another model that incorporates an alternative Manual pass code opening framework utilizing keypad assists with arriving at that entryway in the essential conditions.

In today's era, every "thing" has its own unique identity. What is IoT (Internet of Things). It enables connectivity Allows transferring data to and from physical devices with the user Worldwide through network. Technology is playing an important role in day IoT app for receiving notifications on an Android equipment.

The purpose of this system is that whenever the person Comes in front of the door, the person's movements is Detected by a PIR sensor and as soon as he / she presses Bell button, image is captured through camera The image is sent to the mail on the Android device. The components are added via Raspberry Pi in which A. Internet connection via Wi-Fi. User can unlock the door with the help of mobile lot app. User will Unlock the door if the person is known and will give Authentication to enter the home. Now one day security plays the most important role according to HiTech things and it is noted that "more."

## **1.1 PROBLEM STATEMENT**

In the arising innovation world, security has become one fundamental fixing in every day life. Data burglary Security and protection infringement and so forth are required. The parts that should be secured. Utilizing the secure frameworks for entryway lock and opening became famous these days. This framework is being adjusted by numerous nations and as of now make top of the line nations like USA, Japan and so forth Utilization of this framework. This framework gives either a facials Identification security office or keypad is given to enter the pass code to open the entryway. Despite the fact that it gives assurance

Doors likewise have their downsides: First, if the framework basically utilizes a facial acknowledgment module.

There might be a slight possibility that occasionally the face may not can be identified and subsequently the entryway can't be opened. Also, if the framework utilizes the keypad to enter the pass code Open the entryway, quite possibly the key is likely can be recorded or seen by others without the client's assent. In this manner, two-venture check has been created which utilizes it. There may be a slight chance that sometimes the face may not can be detected and therefore the door cannot be unlocked. Secondly, if the system uses the keypad to enter the pass code Open the door, there is a chance that the key is probably can be recorded or viewed by others without the user's consent. Therefore, two-step verification has been developed which uses it.

Facial acknowledgment as initial step and pass code as following Steps. Be that as it may, similar issues are connected in the recently evolved framework. Subsequently, another model that adjusts the entirety of the above issues has been created.

## **1.2 OBJECTIVES**

The fundamental goal is to give security in private meetings to the higher authorities in any associations. The web camera to catch the arrangement of pictures when the individual press switch. The benefit of this framework is for getting to the entryway is that face location and acknowledgment are performed by utilizing face discovery method and the whole face acknowledgment is finished by squeezing single small press button switch.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **2.1 FACE ACKNOWLEDGMENT BASED ENTRYWAY OPENING FRAMEWORK UTILIZING RASPBERRY PI**

Thulluri Krishna Vamsi, Kanchana Charan Sai, Vijayalakshmi M. in the Domain of emerging development, security transferred into a essential part in our everyday life. Data robbery and also the absence of safety and infringement of security and so many are the fundamental segments which are should have been ensured. Utilizing safety and secure frameworks for entryway based locking system and opening became well known these days. This is framework is being adjusted by numerous nations and 1<sup>st</sup> grade nations

#### **2.2 WEB-BASED ONLINE EMBEDDED DOOR ACCESSING CONTROL AND HOME SECURITY SYSTEM BASED ON FACE RECOGNITION SYSTEM**

Mruthyunjaya Sahhani, Chiraneev Nanda, Abhijet Kumar Sahu and Biswajeit Pattnaik keenn to the home security control framework has got imperative in our day to day life. The plan and advancement of a home security framework, in view of human face detection innovation and distantly observing innovation that affirm guest character and to control the door opening and closing has been accounted for in this paper. This paper portrays about the execution and organization of remote control framework and availability in to a home climate for confirmed individuals in particular.

### **2.3 PLAN AND IMPLEMENTATION OF THE SMART DOOR LOCK SYSTEM WITH FACE RECOGNITION METHOD UTILIZING THE LINUX PLATFORM RASPBERRY PI**

Sourav Roy; Md Nasir Uddin; Md Zahirul Haque; Md Jahidul Kabir  
Protection and Security are two widespread rights and, to guarantee that in our day by day life we are secure, a ton of exploration is going on in the field of home security, and IoT is the defining moment for the business, where we interface ordinary items to share information for our improvement. House security importance and individuals consistently attempt to make life simpler simultaneously. That is the we set up with this task, Face Recognition Door Locking and unlocking System

### **2.4 IOT ENHANCED DOOR LOCKING AND UNLOCKLING SYSTEM USING FACE RECOGNITION**

Rajat Bhise, Nikilesh Phadnis, Rahul Bari, Vijay Dhag an everyday home security level adult to give security to our home IoT based face acknowledgment can be carried out. A standard web camera to catch the picture to distinguish the guest. It's a technique that recognizes the guest. In the event that the face perceives guest, it will welcome them by name and the entryway will be opened name opened. In the event that they are not recognized entryway will opened.

## **CHAPTER 3**

### **EXISTING METHODOLOGY**

#### **3.1 INTRODUCTION**

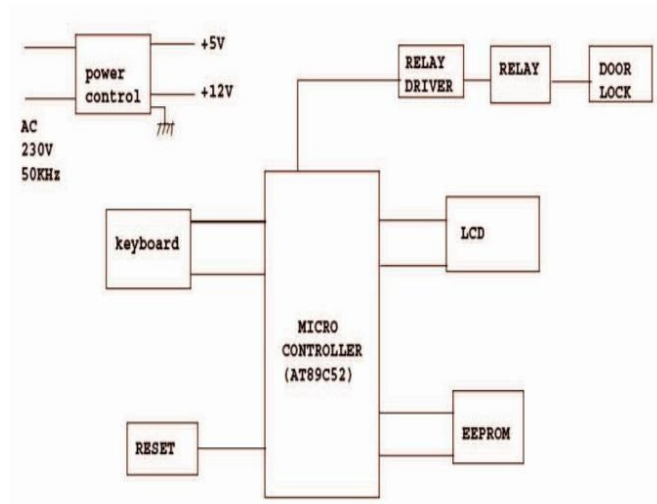
In the existing system, that we are using password based door locking systems which may leads to the user memorize password each and every time. So to overcome this drawback we designingg a replacement system with face detection by pressing single tiny push switch. In the current framework, we are utilizing secret word based entryway lock framework which causes the client to retain secret key constantly. So to conquer this disadvantage we planning another framework with face acknowledgment.

#### **3.2 PASSWORD BASED LOCKING SYSTEM**

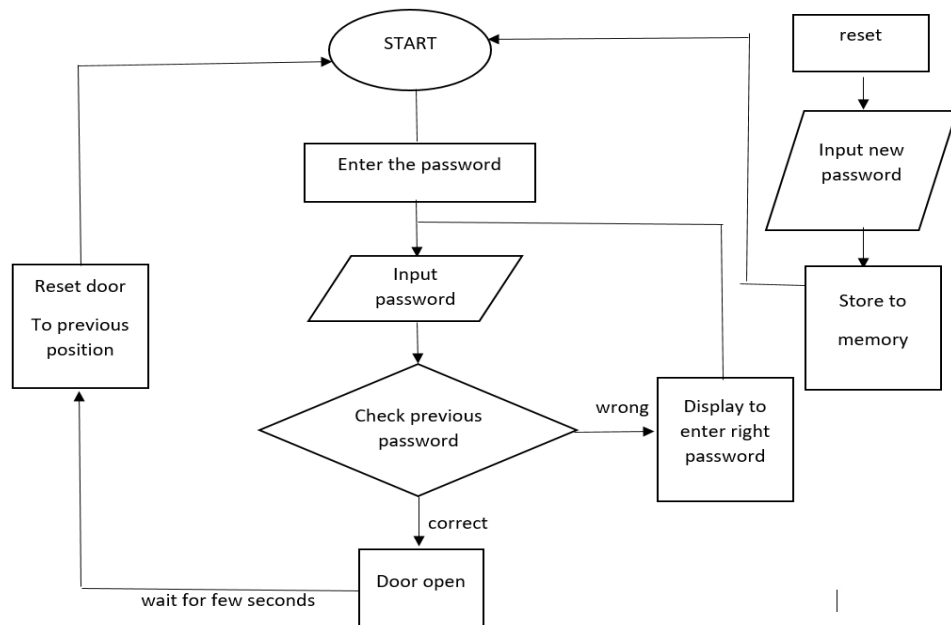
In password based locking system the system cannot start again until when the user press the reset trigger, these system which is done at first and it asks for a replacement password which are going to be stored in a memory of the old password. The system is then never close up when we running the operation. Then the microcontroller will asks for a password when there'll be some person who is whiling to access the space present. Then it'll compare the entered password with the previous password which is about as original password. If the 2 passwords did not match with the system then it asks that person to re-enter the password again.

##### **3.2.1 *Disadvantages***

- It can not give highly security when compared to other systems.
- Every time user need to reenter the password.
- Micro controller can not be connected to high power supplies.



**Fig. 3.1 Existing system design**



**Fig. 3.2 Flow Diagram for an Existing System**

### 3.3 FINGERPRINT BASED LOCKING SYSTEM

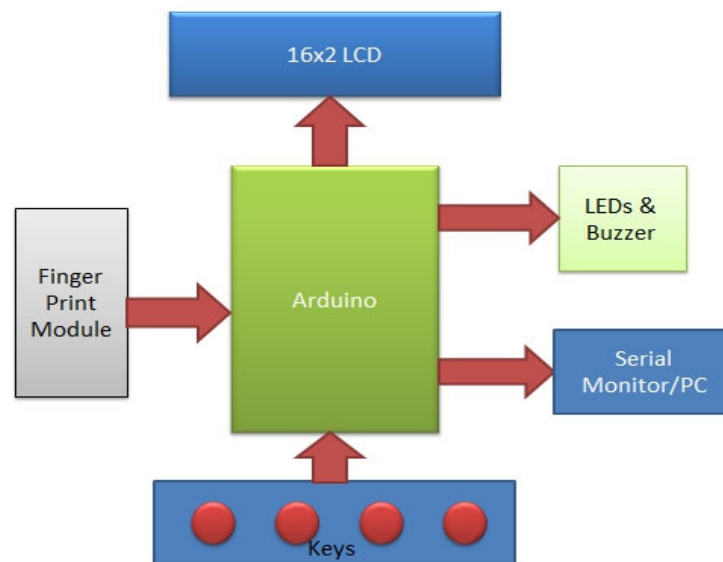
A unique finger impression storage framework utilizing microcontroller utilizes finger impression acknowledgment framework as a cycle of confirming the finger impression picture to open the electronic lock. This exploration features the

Picture with approaching finger impression picture. The moving toward approaching unique finger impression picture will initially go through the extraction

and separating measures through which the data about it is acquired. At that point the data of approaching unique finger impression picture will go through the examination cycle to contrast it and approved finger impression picture. In this work, the unique mark module was prepared to learn and recognize whether the approaching finger impression picture is real or falsification. A lot more extensive utilization of unique mark is for individual validation, for example to get to a PC, an organization, an ATM-machine, a vehicle or a home.

### 3.3.1 ***Disadvantages***

- Bio-metric devices may cost more.
- Entry and erase fingerprints takes a lot of time and also it also cause inconvenience
- Performance can be fluctuate to dry, wet, messy fingers.
- People with skin diseases can't able to access.



***Fig. 3.3 Existing Fingerprint Base Block Diagram***

## **CHAPTER 4**

### **PROPOSED SYSTEM**

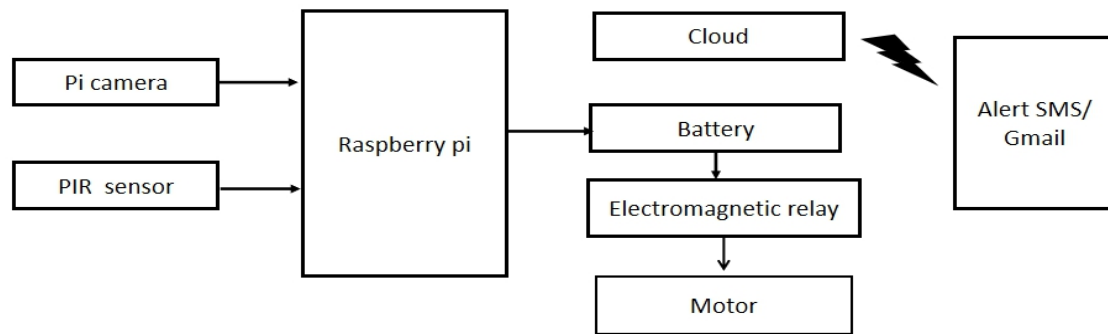
#### **4.1 INTRODUCTION**

In this proposed framework entryway access framework by utilizing face acknowledgment and alongside the email ready framework and ordinary message framework has been introduced. This framework has been utilized with home entryway lock access control dependent on face acknowledgment technique by confirming enlisted facial pictures. Concern people will be educated effectively about the individual identification by means of email alert.

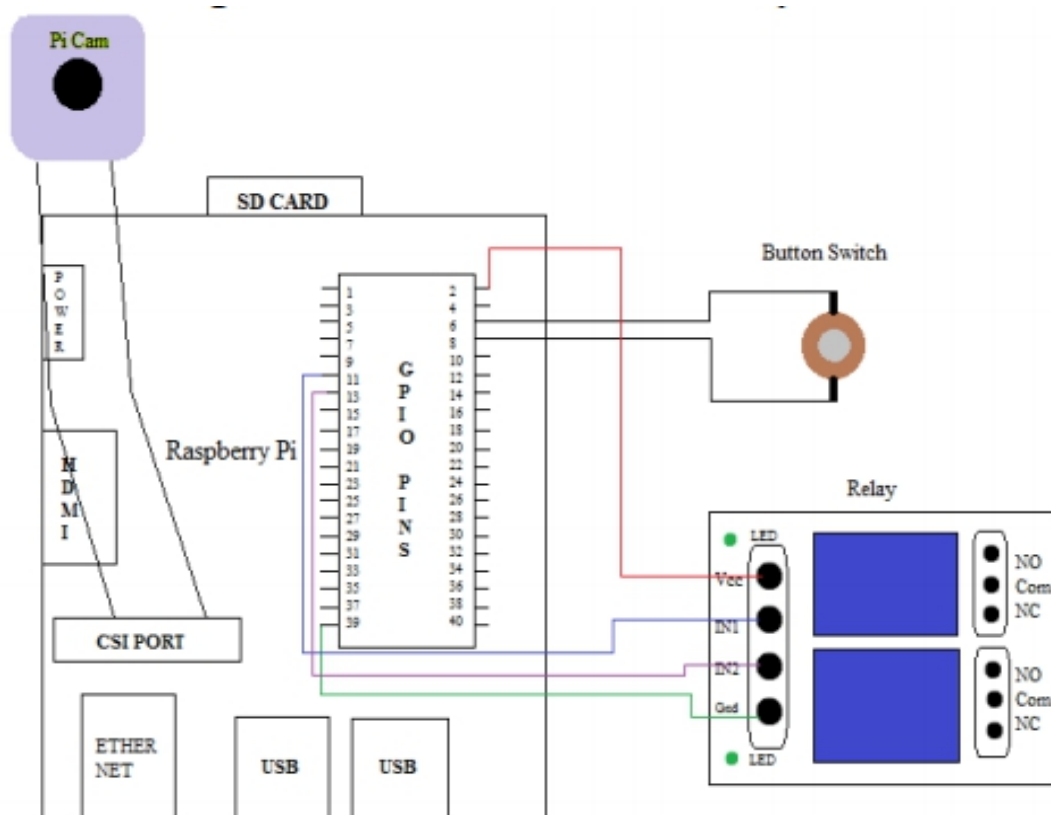
In this proposed system door can be accessed by using face recognition system and also in addition with e-Mail alert system and normal message system has been presented. In this system we can use Raspberry Pi and pixy cam because of it is very accurate and real time controlling unit.

This system has been used with home or any conferences the door lock access control based on face recognition method by verifying enrolled facial images in presence of data base. Concern persons will be informed successfully about the person detection via e-mail alert.

#### **4.2 BLOCK DIAGRAM**



**Fig. 4.1 Proposed system design**



**Fig. 4.2 Circuit Diagram**

#### 4.2.1 System requires following components

1. Raspberry pi B3

2. PIR Sensor
3. Pi Camera Module
4. Electromagnetic relay
5. Dc Motor

#### **4.2.2 Raspberry pi-3 Model B**



**Fig. 4.3. Raspberry Pi-3 Model B**

Raspberry pi is a little Master card size PC, which goes about as a heart of the entire framework. Its a BCM2837 processor, System on chip (SoC) With an ARM having a CPU and GPU. The CPU comprise of Quad center ARM-Cortex A53, 64 bit. Consisting of 1GB RAM. The RPI incorporate a remote Connectivity with 802.11 remote LAN (Wi-Fi) and Bluetooth 4.1, 4\*USB 2.0 ports, a bunch of GPIO (2\*20 pins) header. It likewise has a sound jack, a camera interface, show interface, HDMI port. It requires a force supply of min 2.5 A for sparkling up the repositioned Led's. It consist a small SD card slot at its back, inserting the OS, other files import it in the card and then export all the files and get started. Changes can be made as per the requirements.

```
$sudo apt-get update && sudo apt-get update
```

```
$Sudo reboot
```

The above commands will help user to update the raspberry pi and can proceed further to configure the pi.

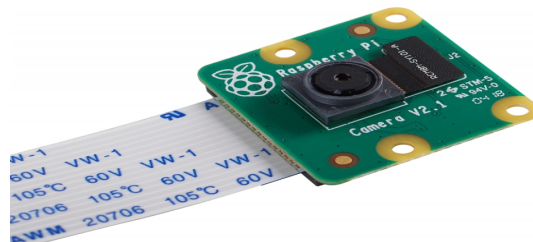
### 4.3 PIR SENSOR



**Fig. 4.4 PIR Sensor**

A uninvolved infrared sensor (PIR sensor) is an electronic sensor that actions infrared (IR) light transmitting from objects in its field of view. ... They work altogether by distinguishing infrared radiation (brilliant warmth) discharged by or reflected from objects.

### 4.4 CAMERA MODULE

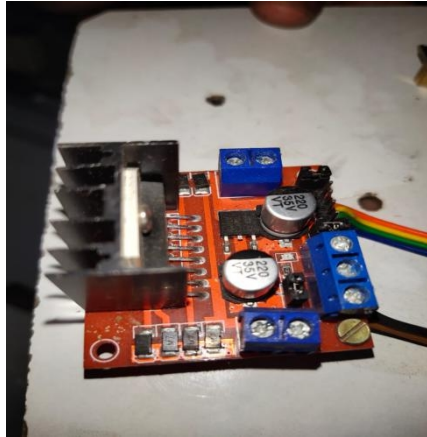


**Fig. 4.5 Camera Module**

The camera module is a 5MP customized designed camera for a raspberry pi. It has a little attachment at the board named as 'Camera Interface' arranged between HDMI port and Ethernet. Supplement the camera module into its space, intended for interfacing a camera. This module permits the client to catch the actually pictures and furthermore to record a video in full HD. At the point when the image is taken its camera see is opened for few moments, utilizing python coding change the goal and send the picture to an android application.

“Sudo raspi-config” is the command which allows you to enable the camera module on raspberry pi.

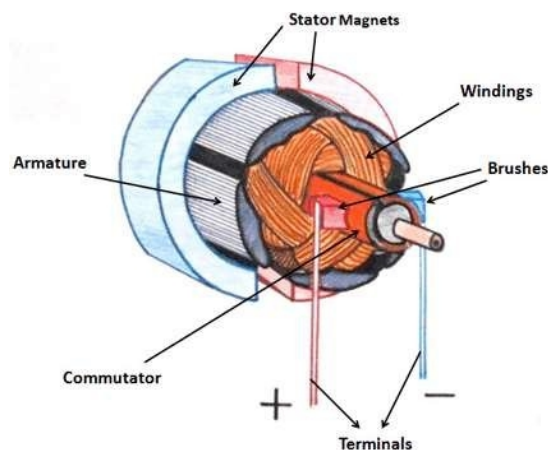
## 4.5 ELECTROMAGNETIC RELAY



**Fig. 4.6 Electromagnetic Relay**

Electromagnetic relay send the signals that which works on the rule of electromagnetic fascination. This electromagnetic relay is a kind of an attractive switch which utilizes the magnet for making an attractive field. This relay switch is used to access the door by sending the signals from electromagnetic relay to the dc moter.

## 4.6 DC MOTOR



**Fig. 4.7 Motor**

A DC engine is any of a class of turning electrical engines that converts direct flow electrical energy into mechanical energy. The most widely recognized sorts depend on the powers delivered by attractive fields. Almost a wide scope of

DC motors have some inside framework, either electromechanical or electronic, to infrequently change the direction of current in piece of the motor. DC motors were the principle kind of motor extensively used, as they could be controlled from existing direct-current lighting power appointment systems.

A DC motor's speed can be controlled over a wide reach, using either a variable reserve voltage or by changing the strength of current in its field windings. Little DC motors are used in instruments, toys, and machines. Picture to an android application. The inescapable motor can chip away at direct current anyway is a lightweight brushed motor used for flexible power gadgets and machines. Greater DC motors are as of now used in impulse of electric vehicles, lift and raises, and in drives for steel moving plants. The happening to constrain equipment has made overriding of DC motors with AC motors possible in various applications.

#### **4.8 METHODOLOGY**

- When the person arrives at a home or any conformance hall and stands within the fronton the door
- he/she will get detected by PIR motion detector.
- Led glows as motion is detected, The PIR sensor is connected to raspberry pi, it's three pins. The GND pin is connected to GND of RPI, VCC is connected to 5V and therefore the output is connected with any GPIO pin.
- As soon the person will press the bell the image is captured with the assistance of a camera module that is pir camera.
- The push button is employed as a switch, one wire is connected with GND and other is connected to some GPIO pin.
- The image of a person is captured and stored during a RPI and immediately send to mail on an android phone.
- So far after checking the mail if person is known then we can access door by lot app this iot app consist of seven buttons we can use any button to give permission if the person is unknown then we make door remains closed.

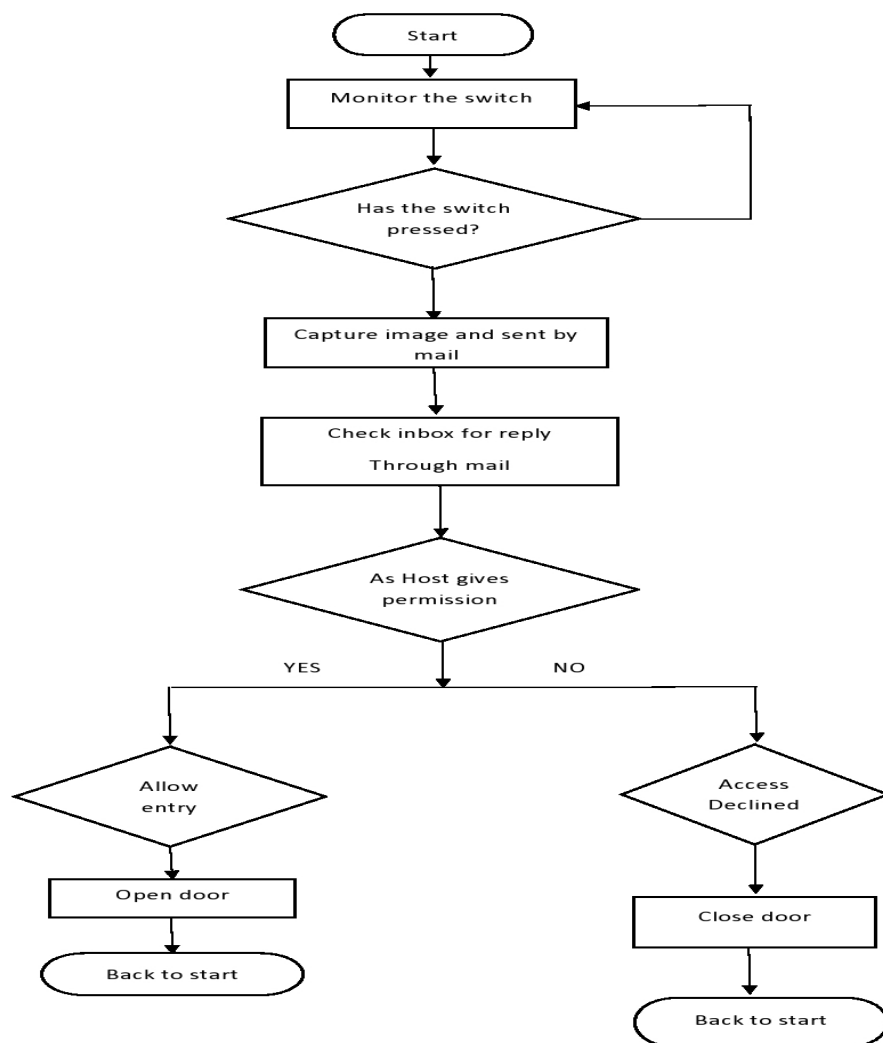


## CHAPTER 5

### SOFTWARE AND HARDWARE ENVIRONMENT

The algorithm and flow chart of the proposed system is given below.

#### 5.1 ALGORITHM



**Fig. 5.1 Flow Chart**

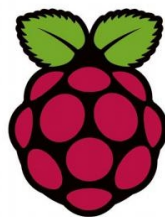
- Step 1: Start
- Step 2: PIR Sensor will find the human detection
- Step 3: Monitor the switch by using push button
- Step 4: If the switch is pressed by the person
- Step 5: PI Camera will start capturing images and sent to mail id through raspberry pi
- Step 6: Raspberry pi will start the process of checking image with data base
- Step 7: If image is matched with data base it will show known person
- Step 8: Else it will show unknow person
- Step 9: By using iot app the door permission will be accessed
- Step 10: If true, Permission Granted door open
- Step 11: If false, permission not granted door remains closs
- Step 12: Back to start

## **5.2 BASIC RASPBERRY PI SETUP**

You may might want The Raspberry Pi boarded contains a processor and illustrations chip, program memory (RAM) and various interfaces and connectors for outside gadgets. Some of these gadgets are fundamental, others are elective. RPi works inside a similar methodology as an ordinary PC, requiring a keyboarded for order passage, a show unit and an impact offer. It moreover needs 'mass-stockpiling', anyway an intense drive of the sort found during a commonplace PC isn't very to keep with the smaller than expected size of RPi. Rather we'll utilize partner degree SD non-unstable capacity minded commonly used in computerized cameras, coordinated in such the most straightforward approach to 'resemble' an extreme drive to RPi's processor. RPi can 'boot' (load the bundle into RAM) from this minded inside a similar methodology as a PC 'boots up' into Windows from its circle.

Coming up next are fundamental hardware used in this system:

- SD card containing Linux bundle
- USB keyboard
- TV or screen (with HDMI, DVI, Composite or SCART input)
- Power offer (see Section one.6 beneath)
- Video link to suit the TV or screen utilized proposed elective additional items include:
- USB mouse
- Web alliance, Model An or B: USB remote neighborhood gadget
- Web alliance, Model B just: LAN (Ethernet) link
- Steam-fueled USB center point • Video cable to suit the TV or monitor used suggested elective extras include:
- USB mouse
- Web affiliation, Model A or B: USB wireless local area network device
- Web affiliation, Model B only: LAN (Ethernet) cable
- Steam-powered USB hub



***Fig 5.2 Raspberry Pi***

### **5.3 CONNECTING EVERYTHING ALONG**

1. Fitting the pre-loaded programming SD Card into the Ras pi.
2. Setting USB keyboard along with mouse to the Ras Pi, possibly through a USB centre point. Interface the hub to control, if essential.
3. Fitting a video link into TV or screen and into the Ras Pi.
4. Attach any of your additional items into the Ras Pi (USB remote neighbourhood, cajole link, outer drive and so on) this can be any place you will really require a USB centre point.
5. Ensure that your USB centre (assuming any) and screen are working.
6. Fitting the capacity offer into the mains attachment.
7. Along with your screen on, plug the capacity offer into the Ras Pi micro USB attachment.
8. The Ras Pi should boot up and show messages on the screen. It's constantly proposed to append the Micro USB capacity to the unit last (while most associations will be made live, it's best apply to connect things like presentations with the capacity killed). The Ras Pi may take an all-encompassing time likewise once controlled on for the primary time, subsequently show restraint!

### **5.4 PACKAGE SD CARD**

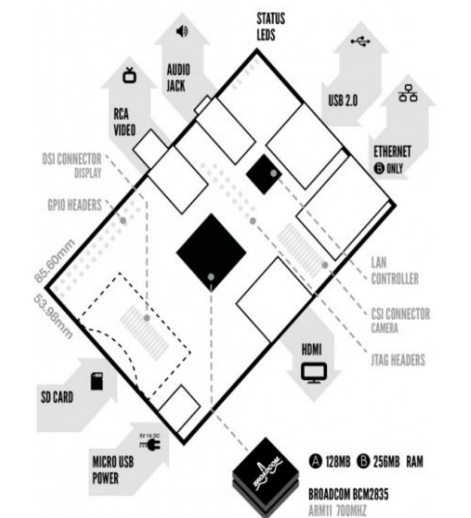
As the RPi has no internal mass storing or intrinsically pack it needs accomplice degree SD disapproved preloaded with a type of the Linux group. • You'll have the choice to make your own preloaded disapproved of misuse any fitting SD disapproved (4GBytes or above) you have reachable. We brief you utilize a recently out of the case new clean leaning to keep awake from conflicts over lost film. • Preloaded SD cards will be open from the RPi look.

## 5.5 KEYBOARD AND MOUSE

Most standard USB consoles and mice can work with these RPi. Remote keyboarded or mice should conjointly perform, partner degreed exclusively need one USB port for a RF electronic gadget. In order to utilize a Bluetooth keyboarded or mouse you'll might want a Bluetooth USB electronic gadget that again utilizes one port. Be are as a main priority that the Model An incorporates a solitary USB port and furthermore the Model B has 2 (normally a keyboarded and mouse can utilize a USB port each).

## 5.6 DISPLAY

There square measure 2 essential association choices for the RPi show, HDMI (High Definition) and Composite (Standard Definition). • HD TVs and a ton of LCD screens may be related using an everyday presence size 'male' HDMI interface, and with a sensible connector if DVI is used. HDMI variations one.3 and 1.4 square measure.



**Fig 5.3 Raspberry Pi Port Specification**

Upheld and a rendition one.4 link is generally suggested. The RPi yields sound and video by means of HMDI, anyway doesn't uphold HDMI input. • Older TVs might be associated exploitation Composite video (a yellow-to-yellow RCA link) or by means of SCARET (utilizing a Composite video to SCARET connector).

Each Buddy and NTSC plan TVs square measure maintained. Once using a composite video coalition, sound is reasonable from the three.5mm jack connection, and might be delivered off your TV, headphones or accomplice degree electronic stuff. To send sound to your TV, you'll may need a connection that changes from three.5mm to twofold (red and white) RCA connectors. Note: there's no straightforward VGA yield on the market. This is much of the time the association needed by a couple of pc screens, beside the most recent ones. If you have a screen with only a D-formed connection containing fifteen pins, by then it's unsuitable.

## **5.7 POWER SUPPLY**

The unit is incredible through the micros affiliation (simply the limit sticks square measure related, as needs be it'll not trade information over this affiliation). A conventional exquisite phone charger with a micro USB affiliation can do, giving it will offer at any rate 700mA at +5Vdc. Check your power supply's evaluations carefully. Fitting mains connectors will be available from the RPi search and square measure guided on the off chance that you're unsure what to utilize.

Note: The individual USB ports on a powerful center or a PC square measure here and there evaluated to deliver 500mA most. Assuming you need to utilize both of those as an impact supply, you'll might want a unique link that connects to 2 ports giving a joined current capacity of 1000mA.

## **5.8 CABLES**

- Video link options: o HDMI-A cable link o HDMI-A cable link + DVI connector and Composite video link and Composite video link + SCARET connector
- Audio link is not needed for the off chance that you uses the HDMI video association to a TV
- Ethernet/LAN link (Model B as it were)

## **5.9 FURTHER PERIPHERALS**

You may conclude you might want to utilize various elective gadgets alongside your RPi, similar to Flash Drives/Portable burdensome Drives, Speakers etc.

## **5.10 NET CONNECTIVITY**

This might be by means of partner degree Ethernet/LAN link (standards RJ45 connector) or a USB remote neighbourhood connector. The RPi Model B neighbourhood port is auto-detecting which infers that it will be associated with a switch or on to another pc (without the necessity for a crossover cable).

## **5.11 USB HUB**

So as to connect further gadgets to the RPi, you'll need to get a USB centre point, which can empower various gadgets to be utilized. It's advised that a powerful centre point is utilized - this can give any further capacity to the gadgets while not moving the RPi itself. A USB 2.0 model is typically suggested. USB 1.1 is alright for consoles and mice, anyway probably won't be speedy enough for elective accessories.

## **5.12 CASE**

Since the RPi is prepared while not a case, it'll be important to ensure that you just don't utilize it in places any place it'll get contact with conductive metal or fluids, except if fitly protected.

## **5.13 ENLAREGEMENT AND LOW-LEVEL PERIPHERALS**

If you propose on making utilization of the low-level interfaces available on the RPi, at that point ensure you have a proper fitting for the GPIO header pins. Conjointly on the off chance that you have a chosen low-level task as a primary concern, ensure you plan in fitting insurance circuits to remain your RPi safe.

## **5.14 FINDING HARDWARE AND SETTING UP**

You will require a preloaded Mount Rushmore State disapproved, USB console, TV/Monitor (with HDMI/DVI/Composite/SCARET data), and power offer (USB charger or a USB port from an incredible USB Hub or another PC). You will apparently conjointly need a USB mouse, a case, and a USB focus (a requirement for Model A). An incredible USB focus can scale back the interest on the RPi. to join to the net, you will require either accomplice degree Ethernet/LAN interface (Model B) or a USB distant neighbourhood connector (either model). When fitting, it's smart to add the limit once the wide range of various things is prepared. - You will require a preloaded Mount Rushmore State disapproved, USB console, TV/Monitor (with HDMI/DVI/Composite/SCARET data), and power offer (USB charger or a USB port from an incredible USB Hub or another PC). You will apparently conjointly need a USB mouse, a case, and a USB focus (a requirement for Model A). An amazing USB focus can cut back the interest on the RPi. To join to the net, you will require either accomplice degree Ethernet/LAN interface (Model B) or a USB far off neighborhood connector (either model). When fitting, it's wise to attach the limit once the wide range of various things is readied.

### **5.14.1 *Serial Connection***

The interface might be a straight forward and straightforward procedure to append to the RPi. The correspondence relies upon PC memory unit insightful data transmission, is easy to arrangement and is normally on the market even before boot time.

### **5.14.2 *Initial Interaction with the Board***

Connect the serial cable to the COM port within the RPi, and connect the opposite finish to the COM port or USB Serial Adapter within the laptop.

### **5.2.3 *Serial Parameters***

The resulting parameters region unit needed to connect to the RPi. All parameters with the exception of Port\_Name and Speed territory unit default

. Port\_Name: UNIX framework precisely does out very surprising names for various sorts of chronic connectors. Select your option:

- Normal Serial Port: ttyS0 ... ttySn
- USB interface Adapter: ttyUSB0 ... ttyUSBn
- Speed: 115200
- Bits: 8
- Parity: None
- Stop Bits: one
- Flow Control: None the interface is generally usable by the clients inside the group dial out. To highlight oneself to the group dial out the ensuing order must be dead with root \$useradd -G your\_name

#### **5.14.4 Super Simple Manner Exploitation Antelope Screen**

Enter these commands below into terminal window

```
screen Port_Name 115200
```

#### **5.14.5 Super Simple Manner Exploitation Minicom Run Minicom with the Subsequent Parameters**

```
minicom -b 115200 -o -D Port_Name
```

#### **5.14.6 User Interface Methodology with GTKTerm**

Start GTKTerm,

choose Configuration->Port and enter the values on top of within the labelled fields.

#### **5.14.7 Windows Users**

Windows seven or prospect users should transfer putty or a comparable terminal program. Users of XP and below will choose from exploitation putty and HyperTerminal.

#### **5.14.8 Initial Dialog**

If you get the prompt below, you're connected to the Raspberry Pi shell!

```
prompt> #
```

First command you would possibly need attempt is "help":

```
prompt> # facilitate
```

If you get some output, you're properly connected to the Raspberry Pi!  
Congratulations!

#### **5.14.9 SD Card Setup**

Now we would like to put in a GNU/Linux distro on Associate in Nursing SD cared and create house for our stuff. You'll be able to use either Associate in Nursing SD or SDHC cared. Within the latter case after all watch out that your laptop cared reader additionally supports SDHC be are in mind that you simply aren't addressing Associate in Nursing x86 processor, however instead a very totally different design referred to as AREM, thus do not forget to put in the AREM port for the distro you're progressing to use.

#### **5.14.10 Data Formatting the SD Card Via the Mkcaredd Txt Script**

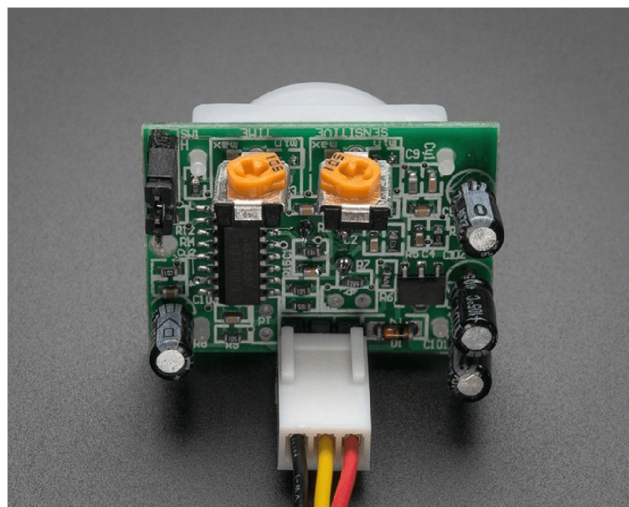
1. transfer mkcaredd.txt .
2. \$ chmod +x mkcaredd.txt
3. \$ ./mkcaredd.txt /dev/sdx, wherever x is that the letter of the cardboard.

You can notice this by inserting your card then running `dmesg | tail`. you ought to see the messages concerning the device being mounted within the log. Mine mounts as `sdC`. Once run, your card ought to be formatted.

## 5.15 MODULES

Most PIR modules have a 3-pin connection at the aspect or base. The pinout may fluctuate between modules subsequently triple-check the pinout! It's normally silkscreened on directly close to the association (at any rate, our own is!) One pin will be ground, another will be signal and furthermore the last one will be power. Force is in some cases 3-5VDC info anyway is likewise just about as high as 12V. Regularly bigger modules haven't got immediate yield and rather just work a transfer inside which case there's ground, power and furthermore the 2 switch connections. The yield of certain transfers is additionally 'open gatherer' - which means it needs a pullup electrical gadget. On the off chance that you are not getting a variable yield take care to attempt connecting a 10K pullup between the sign and force pins.

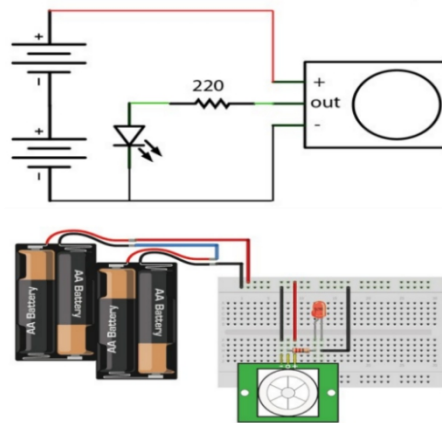
A simple strategy for prototyping with PIR sensors is to append it to a board since the alliance port is zero.1" dispersing. Some PIRs go with header on them effectively, the one's from adafruit have a straight 3-nail header to them for associating a link



***Fig. 5.4 PIR Sensors with Adafruit***

For our PIR's the red connection is + voltage power, dull connection is - ground power and yellow is that the sign out. Essentially promise you plug the connection in as shown already! If you tumble in reverse won't you will not} gathering of courtesans the PIR at any rate it won't work. Presently once the PIR recognizes movement, the yield pin can go "high" to three.3V and illuminate weight the LED!

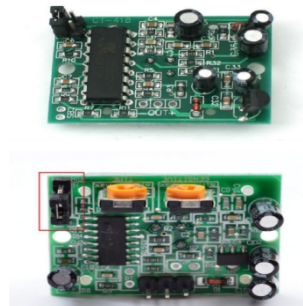
Testing a PIR



**Fig. 5.5 Testing a PIR**

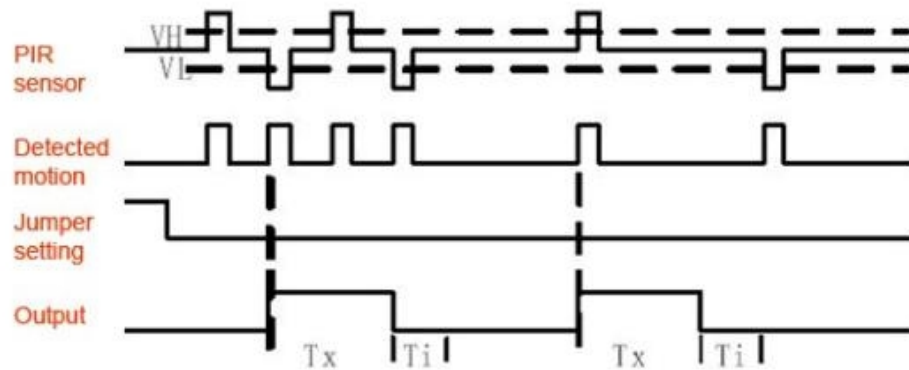
### 5.15.1 Retriggering

There's two or three decisions you'll have along with your PIR. First up we'll investigate the 'Retriggering' plausibility. Whenever you have the diode flickering, look on the rear of the PIR indicator and affirm that the jumper is put inside the L situation as demonstrated beneath. Presently got wind of the testing board again. You'll see that once associating up.



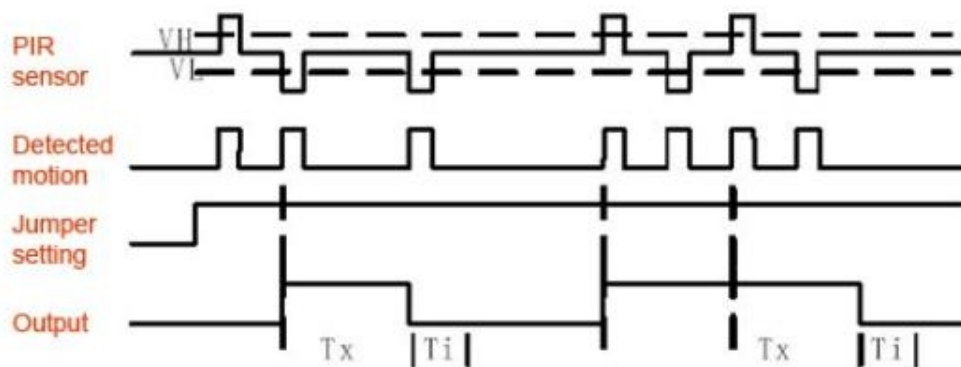
**Fig. 5.6 Retriggering**

As higher than, the diode doesn't remain once acquiring front of it however truly activates and off each second around. That's known as "non-retriggering".



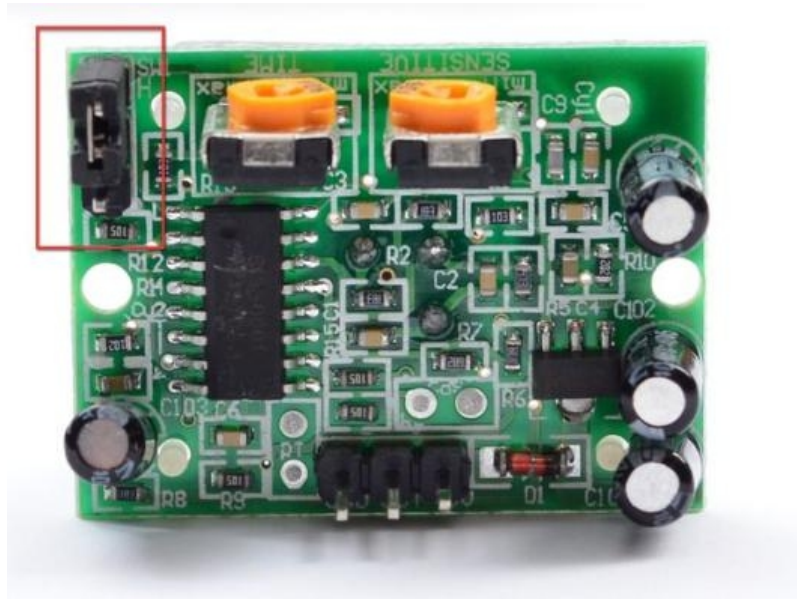
**Fig. 5.7 Non-retriggering**

Now amendment the jumper so it's within the H position. If you got wind of the check, you may notice that currently the diode will remain the whole time that one thing is moving. That's known as "retriggering".



**Fig 5.8 Retriggering**

(The graphs higher than area unit from the BISS0001 datasheet, they rather suck). For most applications, "retriggering" (jumper in H position as shown below) mode may be a very little nicer.



**Fig. 5.9 Jumper in H Position**

If you wish to attach the detector to one thing edge-triggered, you will need to line it to "nonretriggering" (jumper in L position).

#### **5.15.2 Changing Sensitivity**

The Adafruit PIR features a trimpot on the reare for adjusting sensitivity. you'll be able to alter this if your PIR is just too sensitive or not sensitive enough - dextral ma.



**Fig 5.10 Changing Pulse Time and Timeout Length**

There are a unit 2 'timeouts' related to the PIR detector. One is that the "TX" timeout: however long the diode is lit once it detects movement - this can be simple to regulate on Ad fruit PIR's as a result of there is a potentiometer.

The second is that the "Ti" timeout that is however long the diode is certain to be off once there's no movement. This one isn't simply modified however if you are handy with a hand tool it's somewhat.

First, let's take a glance at the BISS datasheet once more

TX=The time duration during which the output pin(vo)remains high after triggering

Ti=During this time period triggering is inhabited see charts for details

$TX \sim 24576 \times R \times C$

On AdAfruit PIR sensors, there is a very little trim potentiometer labelled TIME. this can be a one Mega ohm adjustable electrical device that is another to a 10K series electrical device. And C6 is zero.01uF thus American state =  $24576 \times (10K + R_{ime}) \times 0.01\mu F$

If the R time potentiometer is turned all the method down counter-clockwise (to zero ohms) then

American state =  $24576 \times (10K) \times 0.01\mu F = 2.5 \text{ seconds (approx)}$

If the R time potentiometer is turned all the fare dextral to one Mega ohm then

American state =  $24576 \times (1010K) \times 0.01\mu F = 250 \text{ seconds (approx.)}$

If Rime is within the middle, that'd be regarding a hundred and twenty seconds (two minutes) thus you'll be able to tweak it as necessary. As an example if you would like motion from somebody to show.

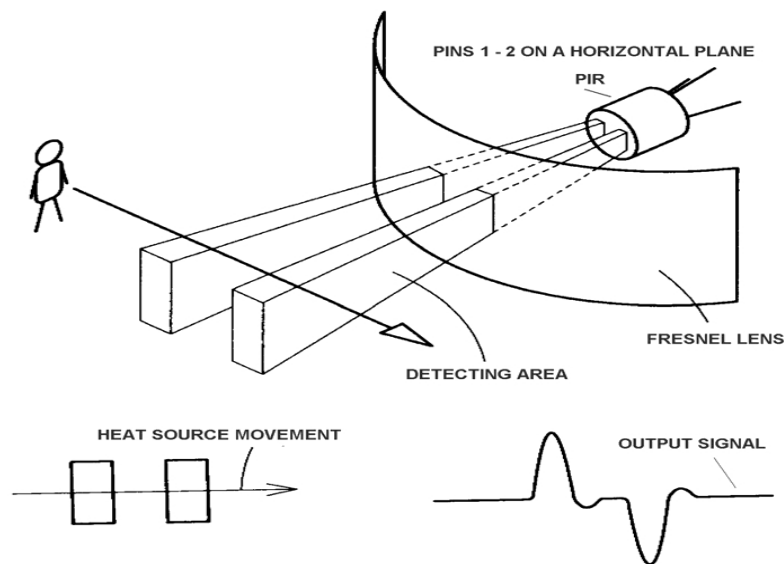
### **5.15.3      *Operation of PIR Sensor***

A not many components are acclimated centre the inaccessible infrared energy onto the locator surface. The window might have physicist focal points framed into it. Rather for the most part PIR sensors territory unit utilized with plastic metameric explanatory mirrors to centre the infrared energy; when mirrors region unit utilized, the plastic window cowl has no physicist focal points framed into it. A separating window (or focal point) is likewise acclimated limit the frequencies to 8-14 micrometres, that is generally touchy to human infrared (9.4 micrometres being the strongest).

The PIR gadget might be considered as a type of infrared 'camera', that recalls the quantity of infrared energy loped on its surface. Whenever power is applied to the PIR the actual science inside the PIR instantly subside into a peaceful state and empower a little transfer. This transfer controls a gathering of electrical contacts, that region unit in some cases associated with the identification contribution of partner degree alert board. On the off chance that the quantity of infrared energy fixated on the indicator changes among a planned time of time.

The gadget can switch the condition of the caution yield transfer. The caution yield transfer is generally a "ordinarily shut (NC)" hand-off; also catch as a "Structure B" relay.

A individual getting into the observed space is identified once the infrared energy radiated from the interloper's body is focused by a focal point or a mirror segment and covers a neighbourhood on the chip, that had precursor been observing some bountiful cooler a piece of the secured space. That segment of the chip is presently plentiful more blazing than once the intruder wasn't there. Since the gate crasher moves, accordingly will the new right on target the outside of the chip. This moving problem area causes the actual science associated with the chip to debilitate the transfer, operational its contacts, along these lines initiating the identification contribution on the alert board. Then again, if partner degree gate crasher were to do to overcome a PIR maybe



**Fig. 5.11 Operation of PIR Sensor**

By holding some type of warm ensure among himself and along these lines the PIR, a comparing 'cold' spot getting across the substance of the chip will make the hand-off debilitate except if the warm secure has an identical temperature in light of the fact that the articles behind it.

Manufacturers propose cautious situation of their product to stop bogus alerts. They counsel mounting the PIRs in such how that the PIR can't 'see' out of a window. despite the fact that the frequency of infrared to that the chips territory unit touchy doesn't enter glass okay, a powerful infrared stockpile (a vehicle headlamp, sunlight intelligent from a vehicle window) will over-burden the chip with sufficient infrared energy to trick the actual science and cause a bogus (non-interloper caused) alert. An individual proceeding onward the contrary part of the glass however wouldn't be 'seen' by the PIR.

They moreover directed that the PIR not be put in such a grasp that partner degree HVAC vent would blow hot or cold air onto the outside of the plastic, that covers the lodging's window. in spite of the fact that air has awfully low emissivity (emanates appallingly little measures of infrared energy), the air handling on the plastic window cowl may adjustment the plastic's temperature enough to, indeed, fool the physical science.

PIRs are accessible in a few setups for a decent sort of uses. The preeminent regular used in home security frameworks has different physicist focal points or mirror portions and has a productive fluctuate of with respect to thirty feet. Some bigger PIRs territory unit made with single area reflects and may detect changes in infrared energy more than 100 feet off from the PIR. There are PIRs planned with reversible direction mirrors, which grant either wide inclusion (110° wide) or horrendously thin 'shade' coverage.

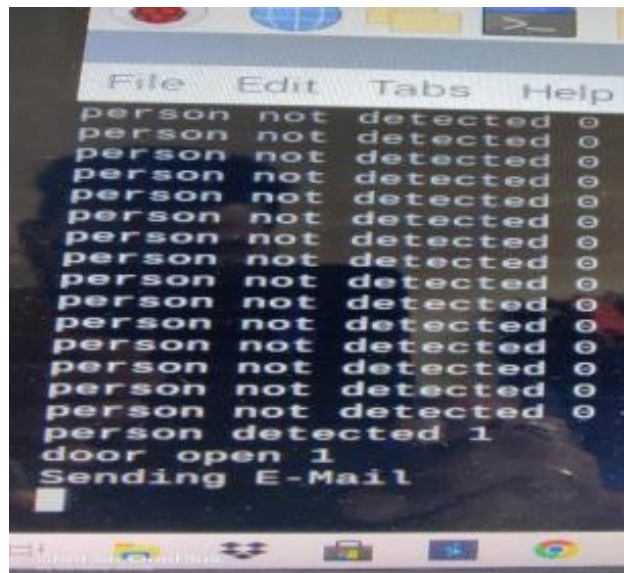
PIRs will have over one internal sensor in order that, with the acceptable physical science and lens, it will notice direction. Left to right, right to left, up or down and supply associate degree acceptable signal.

## CHAPTER 6

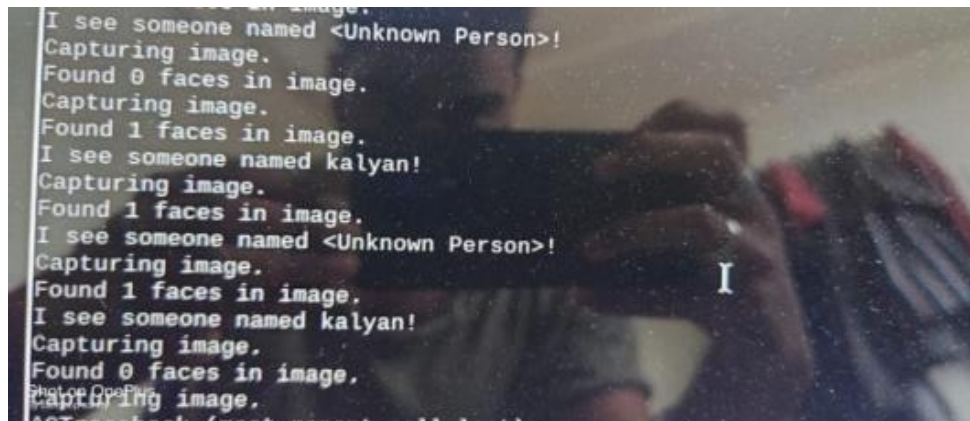
### RESULT AND DISCISSION

We enforced Associate in nursing intelligent, low cost, low power consumption wireless security system by victimization push and pi camera. The system can enable guests once if} the secretary approves the picture of the visitant when received as mail if not then the visitor cannot enter the organization and also the system remains secured.

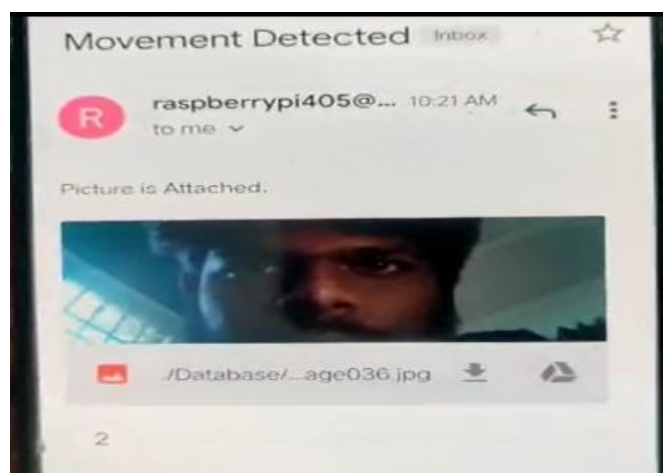
In this project, we've showed that accessing of the picture is finished by only 1 secretary. Whereas implementing much, the system is designed such there is any no. of authorities from Organization will read the picture of the visitant and choose whether or not to produce access or not.



***Fig. 6.1 PIR Sensing Element Detection and Causation Mail***



**Fig. 6.2 Authentication of Illustrrious and Unknown Persons**



**Fig. 6.3. Sending Mail to Registered Mail ID**



**Fig. 6.4. IOT APP for Permission**

## **CHAPTER 7**

### **CONCLUSION AND FUTURE WORK**

#### **7.1 CONCLUSION**

The design and implementation of a sensible secretary system for organizations victimization Raspberry pi. The system incorporates a friendly interface in order that the organization or a gaggle of residences will use whenever they have high security. Communication of the system is wireless and makes the system simple to put in and use. The system is of low price, low power consumption and simply operable. Additionally, with the visitant image is shipped to mail id's for checking if person is known or unknown which ends in additional security and safety.

#### **7.2 FUTURE WORK**

In future, this good security system is enforced such it becomes totally automatic wherever they no would like of a secretary to look at the picture of the visitant once it's received as e-mail. It is designed such the system operation will ensue providing the photographs match and doesn't would like authorization. So this may decrease the man-power deployed.

## REFERENCES

- [1] Beatrice, A., Britto Ramesh Kumar S. and Jerlin Sharmila, J. "IoT based Home security through Digital Image Process Algorithms" India, 2017.
- [2] Charoen Vongchumyen, Watjanapong Kasemsiri, Kiatnarong Tongprasert, Aranya Walairacht, Pattaya, "Door locking system via web application", 2017.
- [3] Daiki Nishida, Kumiko Tsuzura, Shunsuke Kudoh, Kazuo Takai, Tatsuhiro Momodori, "Development of Intelligent Automatic Door System", 2014.
- [4] Gopalakrishnan, K., Sathish Kumar V. "Embedded image capturing system using the raspberry pi system" international Journal, 2014.
- [5] Harnani Hassan, Raudah, Abu Bakar Ahmad, "Face Recognition Based on Magnetic Door Lock System Using Microcontroller". Faculty of Electrical Engineering, 2012.
- [6] Hashem Alnabhi, Yahya Al-naamani, Mohammed Al-madhehagi, and Mohammed Alhamzi, "Enhanced Security strategies of Door protection primareily based Fingerprint", International Journal of Innovative Technology and Exploring Engineering, 9(03), 2020, 1173-1178.
- [7] Mrutyunjaya Sahani; Chiranjiv Nanda; Abhijeet Kumare Sahu; Biswajeet Pattnaik, "Web-Based on-line Embedded Door Access management and residential Security System supported Face Recognition".
- [8] Muhammad Kashif Shaikh, Syed Annas Bin Mazhar, "Comparative Analysis for a Real Time Face Recognition System Using Raspberry Pi", 2017.
- [9] Nareshkumar R. M.,Dnyaneshvari Shinde,- Smart Door Security Control System Using Raspberry Pi Volume 6, 2347 – 8616 Issue 11 November 2017
- [10] Reeta R -Smart Secure Door Lock System Using IoT And Eigenface Approach,Volume 5, Issue 4 December 2017, 2320-2882
- [11] Rishabh Kumar Gupta, S. Balamurugan, K. Aroul-IoT Based Door Entry System Vol 9(37), DOI: 10.17485/ijst/2016/v9i37/102136,October 2016,0974- 6846

- [12] D.Kishore ,Shaik Anwar-lot Based smart Home Security System with Alert Door And Access Control Using Smart phone, vol-5 Issue 12,December 2016,2278-0181