



# FACE RECOGNITION DOOR LOCK SYSTEM USING RASPBERRY PI

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**Abstract:** The most important of feature of any home security system is to detect the people who enter or leave the house. Instead of monitoring that through passwords or pins unique faces can be made use of as they are one's biometric trait. These are innate and cannot be modified or stolen easily. The level of security can be raised by using face detection. The proposed face recognition door lock security system has been developed to prevent robbery in highly secure areas like home environment with lesser power consumption and more reliable standalone security device for both Intruder detection and for door security. This system is powered by raspberry pi circuit. Raspberry Pi electronic board is operated on Battery power supply, wireless internet connectivity by using USB modem, it includes camera, IR motion sensor and a door. Whenever the person comes in front of the door, it recognizes the face and if it is registered then it unlocks the door, if the face is not registered it will raise an alarm and clicks a picture and send it on the registered number. And this system also includes voice announcement system. This is how the system works.

## I.INTRODUCTION

The face recognition-based phone unlocking mechanism that Apple introduced on its iPhones in 2017 was a global phenomenon and has since become a disruptive technology in the smartphone market. Similar to this, home automation, monitoring, and security systems have recently become a crucial component of many people's lifestyles.

The numerous potential uses for computer vision technology have kept it a focus of ongoing research for many years. Among many other things, computer vision and image processing are frequently used for text recognition, depth perception, visual odometry, object identification and recognition, pose estimation, and human face detection and recognition.

The automation, robotics, and manufacturing industries all use the ability to detect and identify things in a camera's range of view.

Face detection uses image processing methods to assess whether or not an image contains a human face. Similar to object detection, face detection is a more sophisticated operation that can be accomplished with manually adjusted feature descriptors and traditional image processing techniques. Facial recognition comes before face detection. Localizing the bounding box for the face in a scenario with several persons or objects presents difficulties.

The more complicated task of face recognition involves determining if the human face that was recognised matches the faces that the programme has already seen. For human faces, it is fundamentally an object-classification/object-detection problem. When it is intended to make the face recognition algorithm robust enough to function well even on images with varying orientations, partial views, variable expressions, and changes in facial hair, additional complexity develops.

**II.OBJECTIVES**

- Real time intruder Detection with image capturing
- Emergency intruder signal to authority or owner via IOT.
- Automatic Lock ON and OFF system.
- PIR Sensor based Human detection.

**III.EXISTING SYSTEM**

The existing system is to unlock the door through passwords and pins and thump impression and some faces too but in this system the people need enter password, pins and should give thumb impression to unlock the door and a person should come in front of the camera to unlock the door.

**IV. PROPOSED SYSTEM**

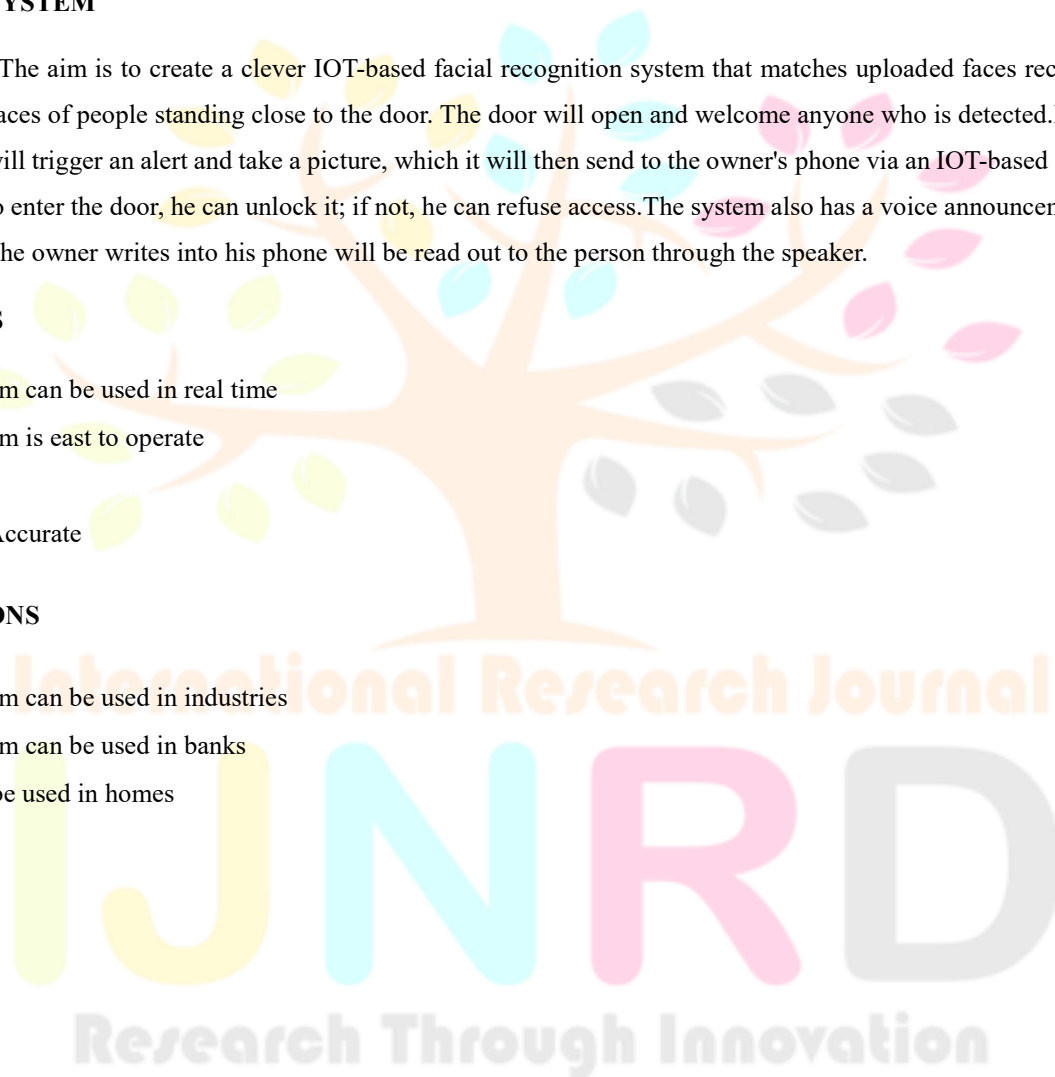
The aim is to create a clever IOT-based facial recognition system that matches uploaded faces recorded in the database with the faces of people standing close to the door. The door will open and welcome anyone who is detected.If the face is not recognised, it will trigger an alert and take a picture, which it will then send to the owner's phone via an IOT-based server. If the owner wants him to enter the door, he can unlock it; if not, he can refuse access.The system also has a voice announcement feature, so that everything the owner writes into his phone will be read out to the person through the speaker.

**V. ADVANTAGES**

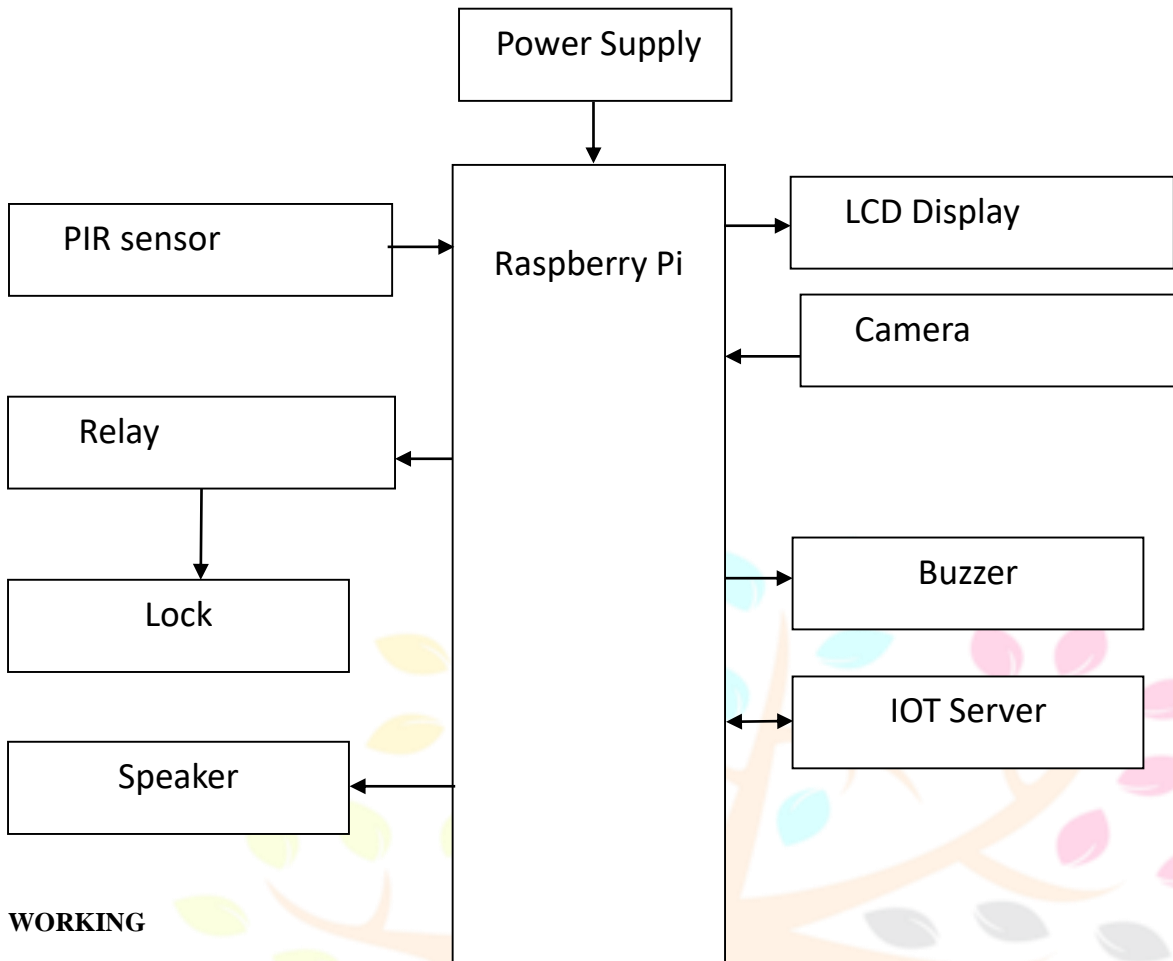
- This system can be used in real time
- This system is east to operate
- Low cost
- Fast and Accurate

**VI. APPLICATIONS**

- This system can be used in industries
- This system can be used in banks
- Can also be used in homes



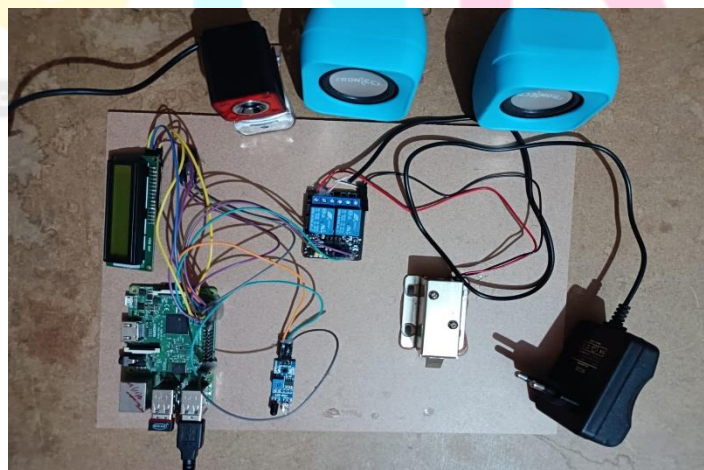
## VII.BLOCK DIAGRAM



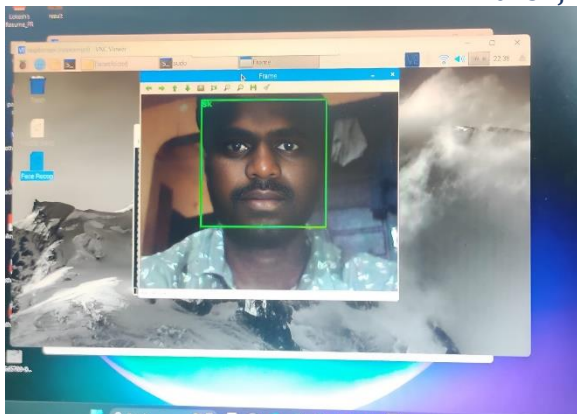
### WORKING

It includes a variety of parts, including a raspberry pi, pir sensor, speakers, LCD display, power supply, camera, buzzer, relay, and buzzer. After these are all connected appropriately, we must first train our faces in the data set. We must initially train our faces using the data set. When power is applied, the pir sensor detects the IR radiations that humans emit and sends a strong signal to the raspberry pi, which then activates the camera and begins taking pictures of the person in front of the sensor and begins evaluating the dataset. After being captured, the image is sent to the owner's mobile device. If the owner wants him to enter the door, he may grant access to that person, and if he doesn't want it, he can refuse access. If the captured image matches the data provided, the door will unlock. If it doesn't, the buzzer will be on. If owner wants to communicate with him, everything owner types in his mobile device will be sent to him through the speakers.

### VII.OUTPUT



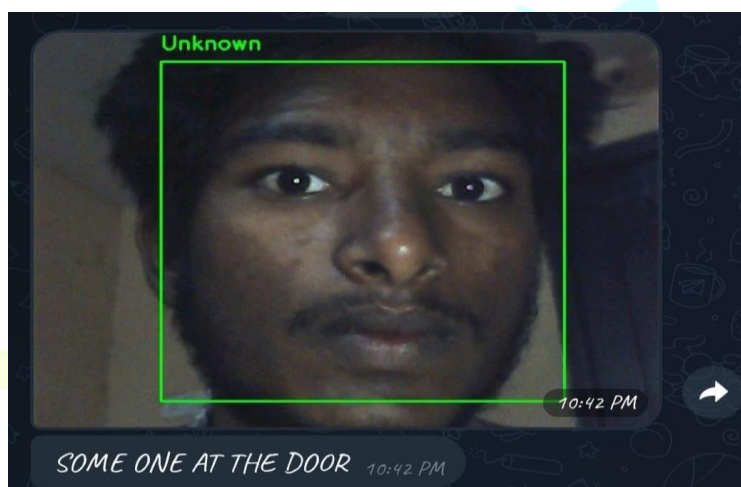
Fig(a). connections to the raspberry pi



Fig(b).Trained face recognizes



Fig(c).unknown face recognizes as unknown



## VIII.CONCLUSION

Face recognition based door lock system has been developed-to-provide better security. The use of face recognition technique makes system more secure. This system can be used in several places where high security is required where confidential information and equipment is kept. For example, research institutes, banks, forensic Laboratories. This system can also be used for domestic purposes. This project helps to reduce problem of thefts and frauds. In case of unauthorized person's entry, system alerts authorized person with Sending image of unauthorised person through telegram and at the same time the buzzer beeps to alert people. This is a cost efficient.

## IX.FUTURE SCOPE

In future, this system can be modified into double verification mechanism such as retina scanner, fingerprint scanner, otp, Pin Code to make security to a great extent. This system will first recognize the face and if face is matched in the data base then it will ask for further verification mechanism may be any one of the above and if the person passes both the verification test then only door will open and if face is not found in the database the image will be sent to owner, he can also communicate with the person. This system will provide good security.

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