

Microsoft Azure Maintained Video Door System for Smart Phones

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Abstract: *In Recent, Home Automation is on horizon. Door Automation is emerging technology in Home Automation. From the last decades a number of standards have been defined for Door Lock Appliances has been increased. The main objective of Door automation is to provide Security locks for door security and energy efficient for users with the help of IOT and WSN. The main aim is to develop a secured Door application using Raspberry Pi and GSM. Raspberry Pi operates and controls motion detector and cameras for capturing the image of the intruder and sends it to the mobile phone or email of the owner and alerts the user about the intruder. In this paper, Biometric is used as secondary for the security purpose. This system will be controlled with the help of Raspberry Pi which can be programmed with Python.*

Keywords: Raspberry pi-3, fingerprint sensor, camera

1. Introduction

Video door phone system is controlled with different key elements in their development. Many security methods have been inserted to make it effective. Both inside and outside the electronic systems of the door is present to make sure the entering person is known one or not. Raspberry pi3 module is inserted so that it saves data in to it and this device allows all the devices to work properly. Instead of system usage raspberry pi device is used to make work easy. Number of sensor devices are developed one of them is finger print sensor. The finger print sensor that used in development process is bio metric one. Where this system scans the user lines in the finger and the gaps between them. PIN entering system is developed for security purposes. Display screen is present to display the activity that performing. Camera is inserted in the system, when an interrupter tries to open the door then it automatically captures the person entry and sends to the owner. So, that if he want he can make a call to the person who is at the outside for that MIC is present, he can hear the owner voice through speakers and can speak accordingly. If the user wants he can give provide access with the help of remote control.

2. Related Work

Md. Tahmid Rashid [1] In this video and voice recordings systems are present. It also detects the intruders and guests. Firstly it captures the image and sends to the owner, if they are known to user, then with the help of remote control gives access to enter inside, if not known then we can have a chat with the persons and pretends to be intruder then we can make a call to police. This is very effective one.

IlkyuHa.[2] enabled a feature with the detection and alarm functions. The special alarm function is used to detect wrong person entry and gives alarm sound so that people can catch that the person.

Lucky Gautam.[3] explained about the automated door opening system using IR sensor. This implementation is to detect whether someone is coming or not. This model is

designed with automated light controlling system and opening the door.

Jaya sree.[4] This system helps in developing of finger print based security system. Finger print sensor is provided at the door, Only the authorized persons with the help of finger print can have access to open the door, not any other persons. This model is one of the best for security.

Niralsha.[5] presented home automation smart devices sensors senses the physical experience and send the information to raspberry pi. The major element in IOT is sensor networks and raspberry pi. Raspberry pi collects the data from devices like fan, light, door motion and opening and closing of curtains, if suppose ambient light is less and you are feeling darkness then according to the light, it will automatically open curtains.

Jayant Dabhade.[6] basically it deals with key less system. Uses motion detecting sensor. It helps in the open of the door only for some time limit and then closes. This was provided by the user itself. When an un authorized person enters it captures image.

Ching-Lung Chang.[7] It uses a wireless technique for communication purpose. It implements video or audio monitoring system for security reasons. Implements protocol to transfer message from source to destination. It tries to make concurrent connections from door phone to all of resident's devices.

Syed Ali Imran Quadri.[8] connects a web camera to the portal ,where it detects the unknown persons entering home and captures images and controls door, if any one tries to open it.

M.A kade.[9] developed a concept from calling a bell. The device analyses the finger print of a person and saves the authorization to the data base. When it detects the finger print person the door opens automatically, if unknown author comes a cellular ring is given to the person inside and the person opens door with the help of remote control.

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Shrutika.[10] introduced a simple and an easy hardware implementation of face detection system using Raspberry pi. This system will program using python language. This system will test across various standard face databases for both real time face detection and object recognition with or without noise and blurring effects.

3. Existing System

Number of methods have been developed for the security purpose some of them are mentioned below:

1) Lock and Key Method

The Lock and Key system provides good security for our things but now-a-days it is not the correct one to use. The technology is increasing randomly, So it is easy for the unknown persons to enter inside with the help of duplicate key or by breaking the key in to pieces.

2) Password Authentication System:

Password system model is the old process. This process involves in entering the security pin present to the door, when security pin entered the door opens automatically and option to change pin is also present. This existing password system is not good enough for security purposes. This type of methods may lead to damage to the owner of the device because it is easy to know the password of the device.

3.1 Disadvantages Existing System

- Keep the PIN code safe and lock clean.
- Power failure.
- Limit the PIN code length.

4. Proposed System

This proposed system has the following methodologies such as: Mobile application in which the details of the image capturing, option to open or close door system with the help of buttons, Raspberry pi 3 module, pin entering system ,screen to display the performing activity ,finger print, sound system. The implemented system has all the modules in a series manner, so that every module access is required to enter inside, if one module fails, we cannot have access to open the door. Finger print senses the finger print of a person next they should enter the security pin and then door opens. If we need to give the new finger print data base to the system, the options will be present to add or remove the data bases, and display screen to display mode of operation. If unknown one trying to enter inside then camera module captures the image of the person and sends to our mobile. So, that if there is any need to talk to person we can make a call and talk with unknown person, they too can respond to us with help of MIC.

4.1 Proposed Algorithm

```
importos, time
frompyfingerprint.pyfingerprint
import serial
importRPi.GPIO as gpio
importdatetime
fromspeak import espeak
```

```
importpicamera
importsmtplib
fromemail.MIMEMultipart
importMIMEMultipart
fromemail.MIMEText import MIMEText
fromemail.MIMEBase import MIMEBase
fromemail.mime import MIMEImage
```

```
#password
password ="4567"
length = len (password)
fomaddr ="***@gmail.com"
toaddr = " ***@gmail.com "
mail = MIMEMultipart()
```

```
mail['From'] = fromaddr
mail['To'] = toaddr
mail[' Subject ' ] = "Attachment"
body = "Please find attachment"
```

```
RS =18
EN =23
D4 =24
D5 =8
D7 =7
```

```
enroll=5
delete=6
inc=13
dec=19
led=26
```

```
motor=17
```

```
High=1
Low=0
ir=2
```

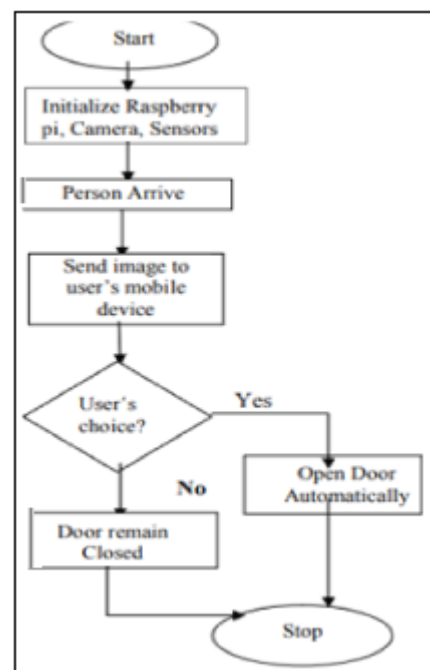


Figure 1: Proposed Flowchart

4.2 Advantages Proposed System

- Reliable
- Low power consumption
- Convenience security
- Energy efficiency for users
- Biometric is used as backup plan.

5. System Design

5.1 System Architecture

System mainly works on Door using different technologies and different components like Wireless LAN module, Motion Sensors, Raspberry Pi B-3 model, Camera (e.g. pi-camera) and display Screen and mobile device. Basically System is featured for security of home implemented for door having automation in it. Raspberry pi requires 5volt DC supply which have in-built Wi-Fi module. Using PIR sensors, it senses the person who is standing in front of Door and it sends signals to Camera. If the person standing near door is don't have access to inside then the system takes the photo of the person using Wi-Fi module on Raspberry pi. Then using Wi-Fi user can operate the motion of Door in the range available. All operations are done on door using these different modules and therefore door act as Smart Door. If suddenly system crashes, then Biometric is used as a secondary for security purpose.

Smart Door Security System has modules like

- Raspberry Pi-3Model B
- MIC /Android app
- Wi-Fi Module
- Camera Module
- Finger Print

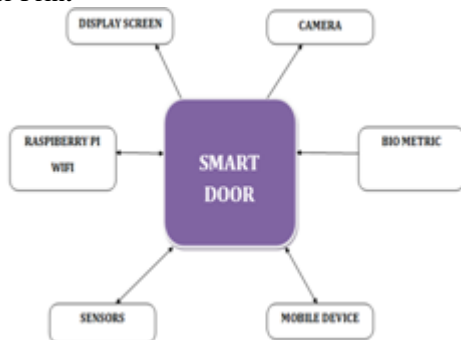


Figure 2: System Architecture

5.2 Modules

1) Raspberry Pi-3

This Raspberry pi module is the major system in our project development. In our system, Raspberry pi act as a main controller. Camera is configured with Raspberry pi to capture and store images. Also sensors are directly connected to Raspberry pi configured with motion of door.



Figure 3: Experimental set up of raspberry-pi

2) MIC /Android App:

GSM is known as Global System for Mobile Communication, which is used for digital mobile telephony system. A GSM module is used to establish communication between a computer and a GSM system. One can use Mobile device having GSM module or Android app for Smart Door Security System, it's user's choice. This module gives alert messages to the users immediately. GSM is in-built application in mobile device and it requires SIM (Subscriber Identity Module), GSM handset and GSM network. Android app is an efficient way to control the system. Using java language one has to develop an android app according to system's requirement. Android app requires authorized user. By registering and log-in one can become authorized user for accessing. User must have Wi-Fi for operating Android app.

In this module we develop the android app which contains two toggle buttons to open and close. If user presses open button, the door is unlocked and similarly if the user presses close button, in the app the door is locked automatically which is operated by Wi-Fi.

3) Camera Module

According to user convince, an user can use web camera or pi-camera. Web camera have minimum 16 MP interpolated resolution also plug and play USB interface which can be configured with raspberry pi which is already connected with the door. The Camera Module is a great accessory for the Raspberry Pi, allowing users to take still pictures and records it.

Starting with Raspberry-pi camera, one has to go to settings and configure it accordingly. Raspberry Pi-3Model B has in-built Camera interface (CSI). To capture the pictures, we need to save file as camera.py and need proper and correct python coding. Run the code and camera preview opens for 5 seconds before capturing a picture and adjust to a different resolution momentarily as the picture is taken. As it is connected with sensors and door, it senses the person in front of door and captures the image and stores it. Then captured image is send to the user's Android App.

4) Finger Print System

The finger print recognition system helps in sensing the finger of persons. In this Biometric system is used. So that it scans the gap between the finger, length of the tip and frequency gives accurately. We can store number of finger print data bases in to this device. Not only storing data base but also removes the data of finger print that is not needed. It is water purified one so that there is no physical damage to this device. Only the authorized persons whose finger print data is present only can have the access to open the door.

6. Conclusion

We designed the System which reduces human efforts and provides security. Proposed system is cheap, reliable, low power consumption and components are easily available. It is also portable and easily upgradable. System provides Security locks for door, comfort, connivance security and energy efficiency for user. Raspberry Pi-3 Model B operates and controls motion detectors and cameras for capturing the image. The security of this method is increased with the help of applying more modules that is providing more number of security devices. If one device fails in security check up, the next security device gives full security lock system. This provides security for corporate or home purposes. This system helps in taking action for the protected devices with in a second of time.

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