

# Smart Bell Notification System Using IoT

Sameer Deshpande<sup>1</sup>, Anamika Majumdar<sup>2</sup>, Atul Kumar Sahu<sup>3</sup>, Vandita Gainedi<sup>4</sup>, Deva Hema<sup>5</sup>

<sup>1, 2, 3, 4</sup> UG Scholar, CSE Department, SRM University, Chennai, Tamil Nadu, India.

<sup>5</sup> Asst. Professor in CSE Department, SRM University, Chennai, Tamil Nadu, India.

**Abstract** – The paper postulates a Smart Bell Notification System using Internet of Things. The proposed system will improve the security system and also reduce human interaction involved. This can be achieved by facial recognition and a password to unlock the door. The door shall be controlled by a servo motor which feeds on binary input system. If the face or password match, the input will be one and the door would open and vice versa. Also an important feature of live streaming over the internet has been incorporated. This will help the owner to communicate with the person outside irrespective of his location. A Raspberry Pi is used as a microcontroller. A touch screen LCD has also been integrated in the unit to enter the password.

**Index Terms** – IOT, Raspberry Pi, Face Recognition, Camera, PIR Sensor, Buzzer.

## 1. INTRODUCTION

This project is a significant step towards smart home and living. With the increase in trend of online shopping combined with conventional trends of delivery we realized that a major inconvenience is faced by the customer as well as the delivery person if the concerned one is not present at his home at time of delivery. This also extends to friends and relatives who may visit your place unannounced. There is also a security concern in the old systems as we cannot see the person outside clearly. The old aged people are also mostly are targeted for crime and looting.

Thus the two fold problem identified is as following [5]:

- There is no smart means through which the owner of the house is notified about the visitor in case he is outdoors or unable to hear the bell.
- There is no smart means through which the owner of the house can communicate and pass instructions to the visitor at the door.

Using the microcomputer, 'Raspberry pi', the smart doorbell, hence solves the problem of visitors remaining unattended in case the concerned person is not available. This smart doorbell alerts you when the bell is rung and lets you see and speak with visitors from your smartphone, anytime and anywhere.

With the most important feature being able to live stream the feed of your front door to your device, be that you're mobile or laptop or your TV according to how one has configured the Raspberry Pi. The medium of course being the Internet. The system also includes an inbuilt 'Face Recognition' module to distinguish between a known and unknown visitor and hence

accordingly enable or disable notifications based on the user's preference settings.

To improve security and reduce human interaction, a key like feature is introduced. This key or password is digital key which can shared with the person who is waiting outside. He/she has to enter the key and may enter. If a familiar face is recognized it will skip the procedure and open the door.

## 2. RELATED WORK

Today, investment in IoT devices and security issues at the international level is increasing rapidly. Especially, the intelligent automation system which shows a rapid increase in interest in many developed countries. Smart Door system will have new applications and it will be developed from the existing smart door systems.

Bhalekar Pandurang [3] this paper aims to design for security purposes. It will work as when bell rings at the door, it will act as a trigger to the camera and the camera will capture the video of the person standing in front of the door, that will be shown to the registered user who is away from home and then he will identify the person and can share the key with that person for a particular time period. This increases great security for homes and that too without human intervention. The system is designed such that the motion of the user will be captured from the camera and the user will be detected and then only he will be given a key to lock or unlock. Our smart lock system will operate over wireless network.

## 3. PORPOSED MODELLING

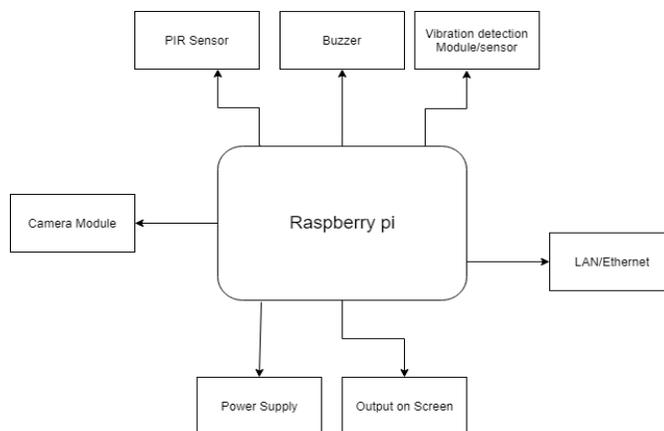


Figure 1 System Architecture

The existing system for smart bell using IoT is that it will capture your image and send a text to alert the owner. In this paper we want to take this simple idea to a next level. The system will have a camera module. The central micro-computer that we are going to use is Raspberry Pi. This will handle and act as the central hub for everything.

So assume a scenario where the owner is not at home and a person is in front of the door and presses the doorbell. At this time, the camera module be activated and the owner will get a notification. The owner will be able to see the live stream from his camera placed above the doorbell. He may also communicate with the person outside with the inbuilt speaker and microphone.

The main and interesting feature of the project is the presence of an extra security feature which is the password or key. The system will have a LCD touchscreen which will act as a input device. If the person is standing outside the door is a known person, they can be granted access by simply typing the key and unlocking the door. Now for such cases, the key generated will be either temporary key or an admin key. This can be controlled by the owner or admin.

Another interesting feature is door unlock by face recognition. This can be done by using a servo motor. I will take input in binary. If the face is recognized then it's a 1 and the access is granted and if not no access. This is another important feature of our proposed system. Plus with the incorporation of features like SMS, email updates.

#### 4. RESULTS AND DISCUSSIONS

This is the implementation of our facial recognition module. First as we can see in Fig 2, we capture the image and save it in our database.

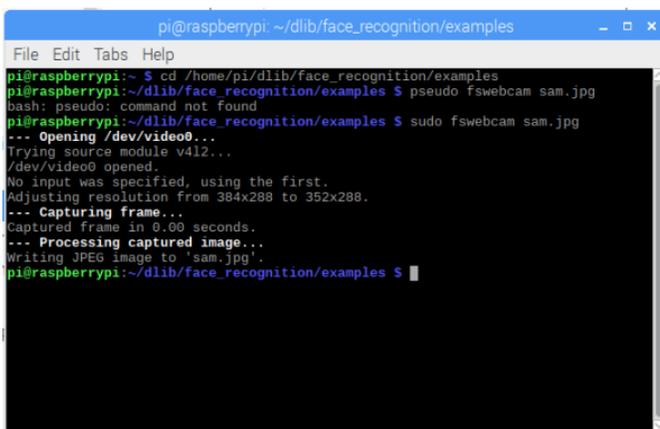


Figure 2 Capturing Image

In the next image we can see the adding the image to our code and integrating it. We are using Python to code and using CNN that is Convolutional Neural Networks Algorithm for comparing the faces. Fig 3 will explain it more clearly.

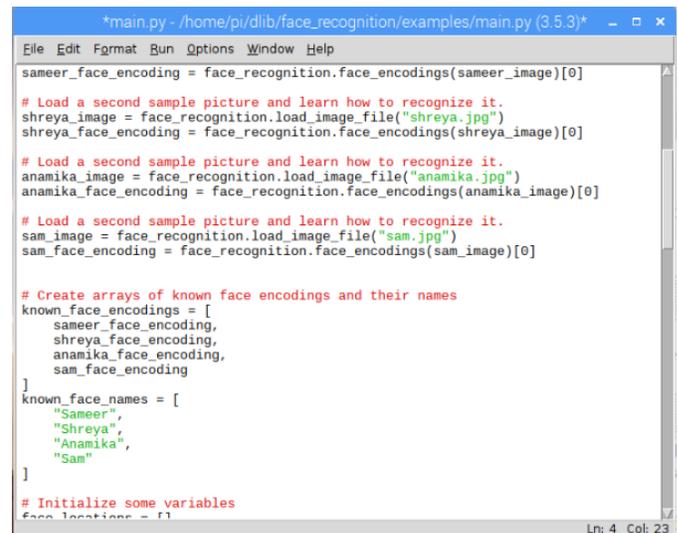
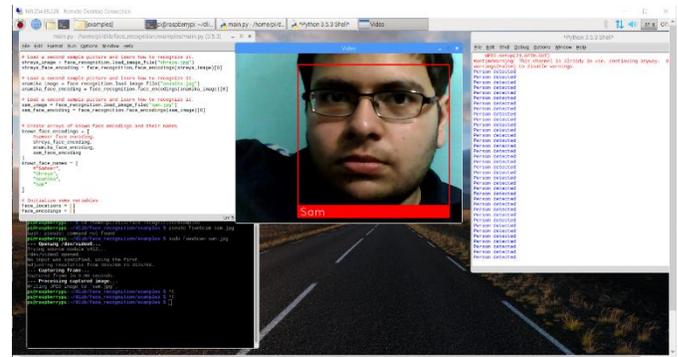


Figure 3 Adding Image to Database

In Fig 4 we can see the facial recognition working and the code running. This is processing on the raspberry pi.



#### 5. CONCLUSION

The whole project takes a new look at the traditional bell vs the modern technology using IoT. With the use of Raspberry Pi, Camera, sensors and other various important modules, our homes are certainly more monitored and secured. This technology will definitely improve the security of our houses. We proposed a system of real time smart door to provide communication between clients and home security. In order to provide effective system, we used Raspberry Pi embedded system which is integrated on the door of a house. The system is based on video technology which is a very popular technology for providing security and safety in urban areas. We used Raspberry Pi because it is a strong and reliable embedded system device for solving complex and challenging tasks. Using both technologies in the system provide various benefits to increase the efficiency in terms of communication between visitor and owner of the house and providing safety of home, thus making use of IoT and integrating it into our day to day lives.

#### REFERENCES

- [1] Ambika, Baswaraj Gadgery, Veeresh Pujari, Pallavi B V, "Smart Bell Using IOT" in International Journal for Research in Applied Science & Engineering Technology Volume 5 Issue VI, June 2017.
- [2] Burak Sarp, Tolga Karalar, Huseyin Kusogullari, "Real Time Smart Door System for Home Security" in International Journal for Research in Applied Science & Engineering Technology Volume 1, Issue 2, December-2015.
- [3] Bhalekar Pandurang, Jamgaonkar Dhanesh Prof. Mrs. Shailaja Pede, Ghangale Akshay Garge Rahul, "Smart lock: A locking system using Bluetooth technology and camera verification." in International Journal of Technical Research and Applications e-ISSN: 2320-8163, www.ijtra.com Volume 4, Issue 1 (January-February, 2016), PP. 136-139
- [4] Deepika M, Hithashree C V, Inchara, Inchara V N, " Design and Implementation of Smart Doorbell using IOT" in International Journal of Emerging Research in Management &Technology ISSN: 2278-9359 (Volume-6, Issue-5)
- [5] Preeti Godabole, Akhil Menon, Prashant Singh, Pramit Yadav, "Communication over Internet and GSM using Smart Doorbell" in International Journal for Scientific Research & Development| Vol. 4, Issue 01, 2016 | ISSN (online): 2321-0613.
- [6] Yash Gandhi , Shubham Vasu, Mayur Katala, Keshav Gavhane, Archana Shinde, "IOT based Home Automation using Raspberry Pi with Doorbell Security" in www.ierjournal.org Research paper.
- [7] <https://towardsdatascience.com/can-a-simple-cnn-work-as-well-as-facial-recognition-for-differentiating-redheads-18596b05fdec>.