Intelligent Door Lock System

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----------**ABSTRACT**----------

Security is one of the important aspect of the home security system. Now a days an unauthorized person access the door. To overcome this we are introducing intelligent door lock system which provides security authentication, flexibility to users. It is based on Internet of Things (IoT).It simply lock and unlock the door from anywhere using cloud.Web cam captures an image, Raspberry-Pi sends an image to Gmail. Firebase database is used to access the door.

Keywords - **Raspberry-PI, Webcam, Relay, Nodemcu, Firebase.**

I. INTRODUCTION

In every one day to day life, door is common device which can be accessed by everyone.First peoples usedbolts and woodenpegs to lock up their homes. Since then, lock-and-key technology has really evolved, which was used by people widely. Again door lock system was evolved to Electronic keys called cards.It have become increasingly common. The cards don't reveal much about the mechanism of the locks they open the key is encrypted in its magnetic stripe but they do provide a blank canvas for ornamentation, which is mostly used in hotels.Again it turns to keypads,it makes possible to imagine a future where a chip in your wallet gives you access to your home. Although electronic systems are more expensive than traditional keys more likely to be found in institutional settings high end home have begun using them and they are expected to become more popular in regular home.An door lock system which is used nowadays provide some characteristic different from the traditional door lock, and also it provides improved features of door lock system over traditional door lock system such as accuracy, convenience, flexibility, privacy, and mobility. But door lock system suffers from various drawbacks such as matching accuracy,for face recognition the most matching image is selected from the database it decrease the matching accuracy, if authorized person tries to unlock the door, face changes in authorized person due to both acquisition environment and physiological characteristics reduce matching accuracy, consumes large volume of storage, mass update doesn't allows users to update and edit database simultaneously, it affects door lock system. In our door lock system, it does not need any database to store images. We have created the Firebase Real-time Database is a cloud-hosted NoSQL databaseto access the door. In our door lock, it captures live image by using web cam and the captured image is sent to Gmail via Raspberry-Pi. By seeing image we can access the door by using real-time database. It is user friendly. It is made as simple as possible with only basic functionalities.

II. LITERATURE SURVEY

2.1 Automatic Locking Door Using Face Recognition

The door will open automatically for the authenticated person due to the command of the microcontroller. Since PCA reduces the dimensions of face images without losing important features, facial images for many persons can be stored in the database. Although many training images are used, computational efficiency cannot be decreased significantly. Therefore, face recognition using PCA can be more useful for door security system than other face recognition schemes.

2.2 Real Time Databases For Applications

A real-time database is one which stores data to database and fetches data from it very quickly but Firebase is not just a real-time database, it is much more than that.

2.3 Review on door bell notify with image capture and forward through email

It uses Raspberry Pi as its controller and obstacle detector that detects presence of someone wherever we tend to place this module either at a door close to home or at offices, factories or the other place wherever we'd like observation and dominant each minute for the aim of security.

2.4 PCA Based Efficient Face Recognition Technique

An image is first scanned and then it is stored in the database of image category for further uses. For face recognition a most matching image is selected from the database. Face of the image is detected and recognition of face is performed. On the basis of particular threshold it is decided that face is recognized or not. For the recognition of pattern, first features are extracted from the image. According to extracted features an image is classified using different methods.

III. EXISTING SYSTEM

The process of collecting images and storing this images into the database takes too much time and large storage.If authorized person tries to unlock the door, face changes in authorized person due to both acquisition environment and physiological characteristics reduce matching accuracy, when someone tries to open the door with similar facial features the database get confused and opens the door. The database needs large storage space to store all images. It opens the door without getting any permission from the user. It is a major drawback for the user

3.1 Drawbacks

- Data storage.
- Matching Accuracy.
- Camera Angle.

IV. PROPOSED SYSTEM

In proposed system,we provide the interface a camera module to capture live face image and it interface relay as output module. Whenever we press the calling bell it automatically captures the image of the guest. The Webcam captures a live image, which easily find by the authorized person and sent it to Gmail. The user can see the image through Gmail account. We create our own database in the firebase cloud, which is easy to access. The door only opens when the authorized user accessed the door via the firebase database. There is no mismatching in face, because the user can see the live image of the person standing in front of then doorand the user can confirm the guest and open the door. It is fully based on Internet, we can only access through our own database.This system provides accuracy, convenience, flexibility, privacy, and mobility.

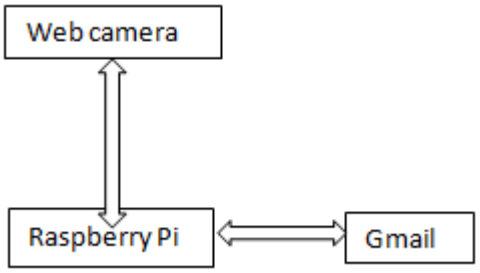
4.1 Advantages

- Easy to see the person who is front of the door.
- Reduces the time consumption.
- Unauthorized user has no access to the registered account.
- The user has the separate account to access the door.

V. MODULES

5.1 Image Processing Module

In this module, when the guest arrives at the front of the door, the guest face images are captured through Web camera and stored in a database which is in Raspberry Pi. It sends a captured image as a message to the registered Gmail account.

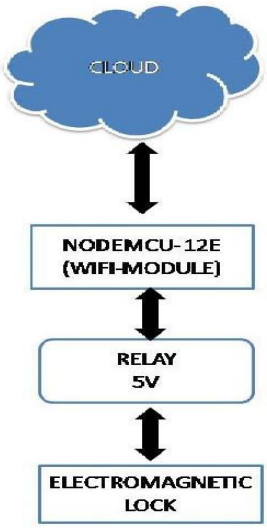


5.2 WIFI Module

In this module, NodeMCU that provides a high level language and a file system allowing to write complex programs and store them for automatic execution when it boosts. The firmware uses the Lua scripting language. The program executed and compiled in the Arduino ide is uploaded to the node Mcu, which is used to connect the firebase database and the doorlock. The program uploaded is used to access the door by using firebase cloud.

6.2 Accessing Module

In this module, the Firebase Real-time Database is a cloud-hosted NoSQL database that lets you store and sync between users and real-time. We wrote a program to connect the electromagnetic door lock with the firebase database. In firebase, the door lock open and closed status is stored as 1 and 0. Whenever we give 1 the door opens and when we give 0 the door locks closes automatically. Using this, we can access the door.



VI. SYSTEM REQUIREMENTS

6.2 Hardware Requirements

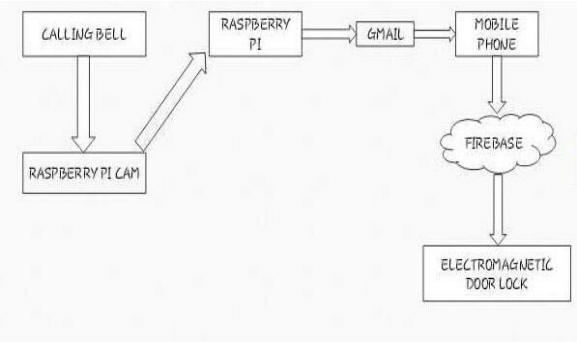
- Raspberry Pi 3B+
- Web camera
- Node Mcu

- Relay 5V
- Electromagnetic lock

6.2 Software Requirements

- Arduino Ide
- Firebase cloud

VII. SYSTEM ARCHITECTURE



VIII. CONCLUSIONS

In this paper, we've got planned a firebase database to access the door easily, which is safer and quicker than previous door lock system. The new system prevents the door from the unauthorized open or closes the door. The lock is accessed only by using firebase database which is created with valid Gmail account which is created by us.

IX. FUTURE ENHANCEMENT

In future it extends to, if someone is trying to break the door, alarm will start beeping on mobile device as well. This can also extends to, in absence of electrical power, battery backup system could be implemented. In this we added that when we press the calling bell it captures the guest image, in future it extends to, if someone stands in front of the door it sense the guest and it automatically open the door.

REFERENCES

[1] Dipesh Vaya1, Teena Hadpawat2, (Feb- 2018).pca based efficient face recognition technique.*International Journal For Technological Research In Engineering.ISSN (Online): 2347 - 4718*

[2] Ishaan Sathe, Chiman Patel,(April-2017) Prasad Mahajan, Tanmay Telang, Sejal Shah,Automatic Locking Door Using Face Recognition. *International Journal of Engineering Technology Science and Research(IRJET).Volume 4, Issue 4.ISSN 2394 – 3386.http://www.ijetsr.com/*

[3] Sonam Khedkar1, Swapnil Thube2,(June-2017).Sonam Khedkar1, Swapnil Thube2,*International Research Journal of Engineering and Technology (IRJET).Volume: 04 Issue: 06. e-ISSN: 2395 -0056, p-ISSN: 2395-0072, https://www.irjet.net/*

[4] Arti Barde1, Swapnil Bilbile2, Shubham waghmare3, Prof. J. D. Dorve4,(Feb-2018).review on door bell notify with image capture and forward through email. *International Research Journal of Engineering and Technology (IRJET).Volume: 05 Issue: 02.e-ISSN: 2395-0056,p-ISSN: 2395-0072. https://www.irjet.net/*