Secure Access Control for Smart Home Locking-Unlocking

Samruddhi Shankar Jadhav
BE, Information Technology,
MET's Institute of Engineering,
Nashik.

Shivani Subhash Shinde
BE, Information Technology,
MET's Institute of Engineering,
Nashik.

Pranali Pramod Pawar
BE, Information Technology,
MET's Institute of Engineering,
Nashik.

Yogita Nanaji Salunke
BE, Information Technology,
MET's Institute of Engineering,
Nashik.

Absract - Home security has become the prime concern for everyone in present scenario An attempt has been done in this work to made home security affordable ,accessible and effective.. Most of the major door lock system have several drawbacks, it creates a issue for a secure life style and proper working environment, to overcome these issues biometric fingerprint and Bluetooth/Internet based door lock system has been presented. In this owner can control their door using the smartphone by viewing the real time activity. Visitors real time activities are store in database. The proposed system sends the message to the owner of the house By using Fingerprint and Bluetooth/Internet technology this all system works.

Keywords :- Home Security; Door Lock System ; Fingerprint Technology; Bluetooth/Internet Technology; Smartphone; Database ;

I. INTRODUCTION

In today's life security is very important. Door is important in every home and for every person to enter and exit. So maintaining security at door is important. Smart lock is an electromechanical lock is used for locking and un-locking purpose lock receives instruction from authorized person

device using wireless protocols. The development of IoT technology makes the human's lifestyle changes into more flexible and efficient especially in doing their activities.

A research has found that people with disabilities have difficulty in accessing lock system for door either using technology or conventional way because it is a bit hard for them to reach the lock. The design of the lock system recommended in the paper does not need a contact between the user and the lock system that it enable all people to access it disregarding their physical condition. The traditional locks works on lock and key.

For example, with a traditional lock, you cannot allow any of your friend or guest to get to your place if your doors are locked and you are not in able to reach .Or if you lost your keys, you either have to a locksmith or break the very lock itself. Smart lock checks the invalid visitor and give alert to user or the owner. Smart lock is also used in office and household. If there is load sheading problem the system can provide a backup for secure home locking. The designed smart door lock senses the impact of an invalid visitor and alerts the user giving notification on his/her mobile .It can be used in every household or in office to minimize the human efforts and can save a lot of time.

The system is featured with smartphone applications. Then todays life, advance automatic door systems are available like: palmtop recognition, face recognition, face detection ,wireless sensors, PIR sensors, RFID techniques, smart cameras and many more that helps people to make their home more secure from long distance. So, people did not have to worry about home security if also they are far from home.

II. LITERATURE SURVEY

Bluetooth based System:

This paper gives idea about controlling home security for smart homes especially for door locks. We use android application for door lock system. It will provides more security to the Android users. This project is on Android platform which is totally Free. So the implementation cost is inexpensive and it is reasonable to a common people. With the help of wireless Bluetooth connection on microcontroller permits the system installation becomes more easy. The system has been designed successfully[1].

It is assumed that the end user will operate the lock using Android Smart Phones having Bluetooth features. The mobile App to operate the lock is developed for Android Phones and will not work on other platform. So it can be available for other platform also. It is also assume that user will operate it within the Bluetooth device accessibility range of 10m to 100m[2].

Password based System:

In this paper more information is given about system basically given on unlock the door by using smart password. Due to this increases the security level so the invalid visitor cannot access the door. In some cases the user may forgets the both passwords, so the system gives the simplicity to the user to change or reset the smart password .Due to this automatic password lock system will give user or the owner secure way of locking-unlocking system. First the user password will be matched with the saved or recorded password which are stored in the system database. User or owner can go for random number of wrong combinations before the system will be shut down for some time. The automatic door will be unlocked if the user or owner record matches with the database the system with the password will unlock. So with help of same password or code it can lock the door as always. This system will give the user an opportunity to reset his own password if he wants [6].

In daily use security of any thing or pattern password systems are important in security. Such project are considered about this and created a secure access for a door which needs a password to unlock the door. Using keypad it enters a password to the system and if entered password is correct then door is open by motor which is used to rotate the handle of the door lock. When it is entered incorrectly at the first time it will give three attempts to enter the password. Some extra features like adding new users and changing old password are configured by the keypad as usual. To display messages to the user LCD module is used. Now a days most of the systems are automated in order to face new challenges to achieve good results. These systems have less manual operations, so the flexibility, reliabilities are high and accurate are there characteristics. Hence every field prefers automated control systems especially in the field of electronics [7].

Biometrics based System:

The palmtop system is one of the next step for fingerprint system. It operates on the image of palmtop. First the system takes an snap of the palm then it start working on the image matching the requirements.At the end, verify the right person. Hence the chances of bugs are less in other human recognition methods and c the problems which are faced in the fingerprint system. The biometric technique is very useful in bank lockers[3].

This biometric technique are used for bank locker also. Except fingerprint recognition the vein detector and iris scanner gives best and accurate result so, in the bank security system , microcontroller continuously monitors the Vein Detector and Iris Scanner through keypad authenticated codes[4].

Due to this fast based principal component analysis(PCA) approach is choosed through which the modification of principal component analysis approach for the face recognition and face detection process is done [10]. The captured image by through the web camera it is matched with the image which is stored in the system database. New advanced door lock security systems are available based on the pattern of the human iris for providing a high level of security[5].

This numerical codes and tokens are widely common methods for home security, and they have

been used for this purpose for a quite a long time. the unique features of person's body parts, so the biometric system are increasing day by day. The technology can be defined as automated methods for recognizing human individually based upon one or more unique parts of their body or behaviour. It includes all biometrics like iris, face, voice , etc as shown in Figure 1.

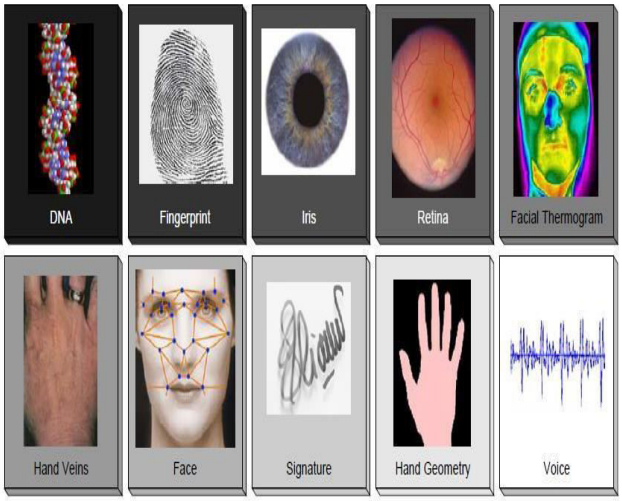
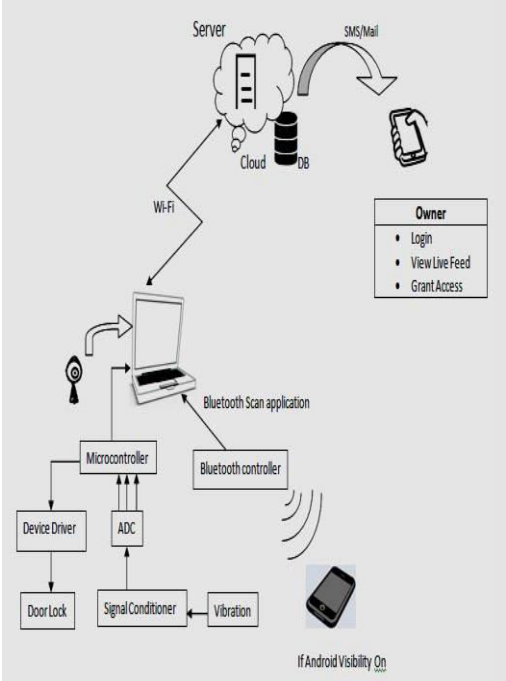


Figure 1. Different biometric attributes

III. ARCHITECTURE

The system provides various modules such as fingerprint, Bluetooth/internet. For fingerprint the fingerprint scanner is used and for Bluetooth/internet the Bluetooth protocol/node mcu is used .Owner can track the activity of guest. Owner can verify the person and grant access to them.



IV. METHODOLOGY

Fingerprint and Bluetooth/Internet recognition method is used for building a secure home locking technology.

Fingerprint Recognition:

Fingerprint is recognized by an automatic pattern recognition system .Fingerprint recognition, basically divided into three types of stages:

1)Data acquisition: In this stage, through user interface the fingerprint data is acquired The image obtained is stored in database.

2)Feature extraction: In this stage, fingerprint features are extracted and then stored in database along with the details.

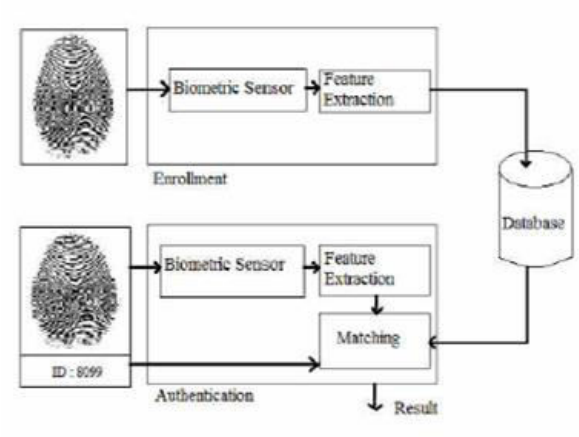


Figure 2: Fingerprint Module

3)Matching: In this stage, the decision is made for a person to authenticate identity who intends to access the system.

Bluetooth/Internet Module:

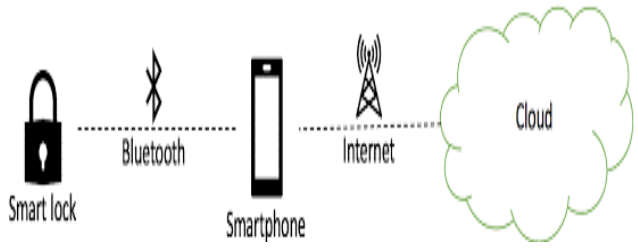


figure 3: Bluetooth Module

Search Bluetooth/Internet Module: Search Bluetooth/Internet module for unlocking the door or accessing the Door.

Create Communication: Create a communication link between Bluetooth/Internet devices for unlocking the door.

Send user Selection: While connection is established, sent user's selection to main control board.

Saved Details: Saved the details of the user and history of visitors through internet in the cloud.

V. CONCLUSION

Hence Combining both the methodology we can built a secure home locking system. With the help of home security system for doors provide advance security for of today's home owners. Smart home systems serve three main benefits : security, accessibility, simplicity.

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