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Smart Door Lock System

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ABSTRACT

Security plays major role in today's life; this work mainly deals with security. Here we make use of fingerprint sensor, GSM module and arduino microcontroller. The finger prints of authorized person are previously stored in microcontroller, by using matching algorithm we check whether the person is authorized or not. If the person is authorized OTP (One Time Password) has been sent to that authorized person mobile number using GSM. If the person fingerprint does not match with previously stored finger prints the he is unauthorized person so OTP will not sent to his mobile number instead buzzer will turn on indicating that someone is trying to access door. This can be implemented to the places where security place major role that is in banks, offices etc. The main aim of this research is to provide high security with low cost, because security plays major role in our society in almost every sector

Keywords: OTP, door lock system, SMS, finger print, GSM, password

I. INTRODUCTION

Security to confidential things, properties and life is very important. We should provide proper attention to these things to avoid unnecessary damage to them. There are so many systems already existed in the society to provide security, among those the microcontroller based door lock system is one of the best method to provide security. In this system one unique password is set by the programmer the user should know this password and it is his responsibility to maintain that unique password confidentially. The person who knows the password can unlock the door. It is like ATM card pins. If the code entered by the user is incorrect then buzzer facility will be provide at the locker it will sound and inform the owner that some unauthorized person is trying to access the lock. This system is not best method to provide security because the authorized person can have the chances of forgetting the password or he shares the password with someone so it will not provide that much security as we expect. The main features of the existing system are as follows: Existing system has same method of giving alarm signal, and those systems are based on microcontroller and GSM module only. Attackers and unauthorized user who does not know the password can make OTP attempt. Therefore, if an attacker mistype the OTP more than given number of time then alarm transfer to the home owner mobile device. The OTP and finger print based security system is implemented in order to overcome the drawbacks of previously existing systems like digital and mechanical door lock system. The security systems are classified based on the technology used to implement them in real time i.e, Biometric type, password based system,

GSM based system, Motion Detector Based System, VB Based System, Combined System, Social Networking Sites Based. The existing security systems are unique code is set by the programmer the system will work only if the proper code is entered by the user. Further the system security can be increased by adding one more feature that user can change the password any time as it is stored in PROM [1]. The other system is developed by ANNIE P. Omen et that allows changing the password. That includes palmtop recognition featuring fingerprint recognition. It operates on the process called image processing [2], initially it takes the picture of the palmtop then it portioned the image using the process called image process. So that this method will reduce errors in other systems like biometric system. The extended security systems are available in the market that is based on pattern of human iris which provide very high security. In almost every security systems GSM is mainly used in order to send and receive SMS at the time of authentication and for detecting the obstacles many sensors are used. The recently invented security system is remote control security system. In this system the GSM hand set acts as transmitter and another GSM mobile set with DTMF decoder with motor attached to the door lock by using DTMF decoder , microcontroller unit and a stepper motor. This is most useful security system because now a day's people want to secure their homes though they are far away from home so this is invented by Jayashri Bengali et al [3]. The other system called entry way security framework [4] is intended to allow only the authenticated person with valid smart card of RFID is required for passing the door. In these type of security systems user have to place a tag in contact with RFID detector then only the entry way gets opened. This can be used in maintaining the attendance and person tracking [5], invented by K Srinivasa et. al. The existing system is Bluetooth based system these system uses arduino platform and Bluetooth module [6]. The motor detector system works based on the principle of amount of light energy falling o the photodiode. In this system the constant light from the laser is falling on to the photodiode if any obstacles arises light falling on the diode is reduced this in turn reduces the voltage level and informs the owner about the break in, then the automatic lock will be activated[7]. The existing system is electronic eye [8] indicates the system which captures the door images of homes and offices. This system works as capturing the image when the door is opened and displaying these images using VB application on computing systems. The locker security system [9] which contains fingerprint sensor, GSM and RFID which authenticates the person and unlocks the door. The other system is social networking sites based [10] it can provide security using phone device and web camera. This system has a pin which is used to close and open the door from specific region using SMs from social sites like whatsapp and facebook etc.

II. System Description and Block Diagram

A comprehensive description of Smart door lock system is given below

2.1 System architecture

The Below figure 1.(a) shows the system architecture of smart door lock system. The basic operation of the device is on power up the device displays a message on the LCD and a red status led lights up, indicating that the door is locked. The user then has the option of entering the authorized mobile number then OTP will send to that mobile number; if the entered OTP is incorrectly then the display will show that the OTP was invalid and then revert to the default screen. When the OTP is entered correctly, the fingerprint scanner activates. If the scanner recognizes a fingerprint that has been enrolled then it will activate the relay and the green status led for a few seconds, enough to open the door enter and close it.

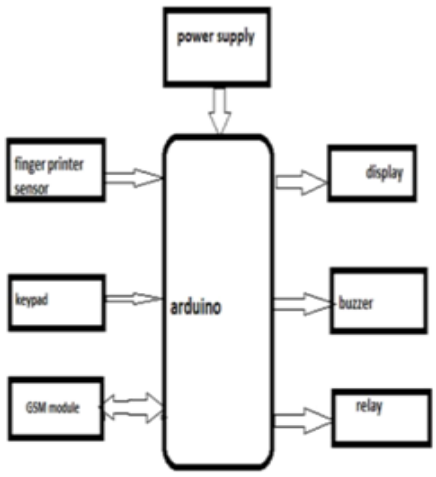

Fig: General Block Diagram of the smart door lock

The steps of proposed work as given below

Step 1: Person who wants to enter the room should enter his registered mobile number. Then OTP generates by the system

Step 2: OTP sends to user's mobile phone.
Step 3: OTP enters through the keypad on the door
Step 4: If mobile is OFF, enter zero through keypad then security question will ask by system.
Step 5: Answer the security questions.
Step 6: Finger print verification takes place.
Step 7: If it matches then door opens

III. Results and Discussions

The smart door lock system is arduino microcontroller based security system. This allows the access to authorized person by verifying both fingerprint and OTP. This system uses arduino micro controller and GSM technology. GSM is used in order to transmit and receive OTP (One Time Password) between user and the controller using mobile phones SMS service. So that it can authorized the person who wants to unlock the door.

The proposed model as shown in figure 2.The locker or door opens after the fingerprint verification is done. GSM module can be used as a receiver, which send messages to the authorized person and notifies him by mobile application and buzzer will sounds so that proper immediate action will be taken care by the owner. So that this provides dual security with low cost and implementation is also very simple.

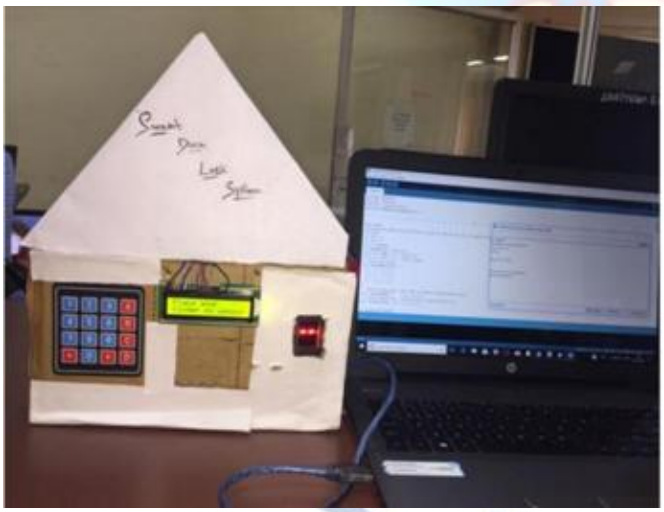

Fig: The proposed model

IV. Conclusion

The automated door lock system is implemented using Arduino, fingerprint sensor and GSM module for OTP transmission and reception. This work is less expensive and easy to implement so that common man can also get high security, the microcontroller permits the system installation in more easy way compared to other existing systems mentioned above. The applications of this system are they can be used in office, banks etc

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