AUTOMATIC DOOR LOCKING SYSTEM WITH SMS ALERT USING IOT

JOTHIKA.R
BCA,VIT UNIVERSITY
VELLORE

G.K. LOSHMIN
BCA,VIT UNIVERSITY
VELLORE

P.AARTHI
BCA,VIT UNIVERSITY
VELLORE

Abstract- This project is about automatic door locking system Using finger print sensor with Phone SMS Alert message notification which helps to alert the owner to secure our house from unauthorized person suppose try to open the door lock. We just used the some hardware requirement are carried out. A fingerprint sensor, Subscriber Identify Module (SIM), Liquid-Crystal Display (LCD) screen , Global System for the mobile Communications (GSM), Relay (5 Volt) , Node MCU (ESP32) and an Arduino UNO micro-controller board were used in this project. The authorized person store the fingerprint using the sensor and it will be stored in Arduino UNO micro-controller board use of code in Arduino Software. When the fingerprint matches with the code of algorithm then, It will be stored in the cloud computing of drive storage. When the validation is matches , LCD screen display the message as "Door unlocked Welcome home" . For unauthorized/ not valid person try to open the door using fingerprint Arduino micro-controller broad deny access to open, at the same time send a SMS Alert message to registered GSM (SIM Card) module and also make call to the person about the issue. Its help to make a quick action in the pandemic issue for the owner with high quality of security and minimal cost.

Keyword: Arduino UNO board Micro-controller, Fingerprint sensor, LCD display screen, GSM module and Node MCU(ESP32).

1. INTRODUCTION

In this current world, Technology have more advancement.In Daily updates, we have technology improvement from the past upcoming years. At the same time , Crime rate also increased. So, everybody need a security and protection for our home .
Nowadays, people are very afraid about the safety of their premises. For an example, a house without its owner is not safe enough to store valuable things or leave kids behind, because no safety procedures taken and the intruder take opportunity to break the simple locking system.Previously, various controlled measures taken and invented to prevent from unauthorized person. At the techniques, they use the pattern password. They have a some disadvantages on it. May be unauthorized person can able to use the password pattern. But, In this project, we use the fingerprint sensor to make a more secure for door lock. The fingerprint matches as more security and protection because everybody has a unique fingerprint. This is the reason we use that sensor and also we make a SMS alert message. It will send the emergency message to the particular register number or owner of the person to take a quick action from the pandemic situation.

To improve the standard of the locking system, this project was built upon various hardware and software. The project is coded to have a locking system will activate by getting a input of correct valid of finger print from the user. In this case, the right user will be able to enter into the house. Besides, this project will use the micro-controller in order to interface or create a communication platform between the input signal and door locking system. This system function at low cost compared to the cost of the traditional security system. We want to make 24 into 7 services by using registered Fingerprint in this system. We can unlock the door which increases the security level to prevent an unauthorized unlocking. If the user forgets or an changes on the combination of fingerprint. this system gives the flexibility to the user to change or reset fingerprint .

2. LITERATURE REVIEW

In this review have a several plans and executions are done by the various methods to test the valid and invalid access for the door. Each system features a unique idea and executions. The system shown in [ ] . Aim to develop a security protection for the door locking system using the Arduino UNO and mobile Bluetooth connections with servo meter. This mobile Bluetooth connect with microprocessor and it control the servo meter door.This method developed by the LDR sensor. the most demerits of the project is that it doesn't have high security protection. Because, Through Bluetooth connection can ready to happen unauthorized malfunctions.

Within the study [ ], they use the pattern password door locking system using IOT for the house security system. The user can control the door with servo motor and patter password using Arduino UNO software. On of the disadvantage is using the pattern password unauthorized person can able to access it after knowing the password for the door lock. Another study of of Review [ ] . They use the Face recognized door locking system. For this, They use the Arduino UNO, Relay , NODE MCU (ESP32). Use of Node MCU, It makes a network connection and WIFI setup using the IP address. They enroll the user face and deduct the valid face of the owner to unlock the door. Main Drawback , during this face deduction unauthorized person can able to access the door use of authorized person photo pictures.

3. DESIGN AND METHODOLOGY USING ARDUINO UNO ATMEGA328P

FIG.1. Show the Diagram of the implementation work are included in all hardware requirements that are used to complete the security task .Arduino UNO is a main part of the project. It act as a main role for the security. All other hardware requirements are depends on the Arduino UNO Board. Remaining requirements are all connected with Arduino Board. The finger print data are stored in cloud computing. Each and every requirements are made a major role in a different way to provide a enough security protections and all these tools are work together under the micro-controller.
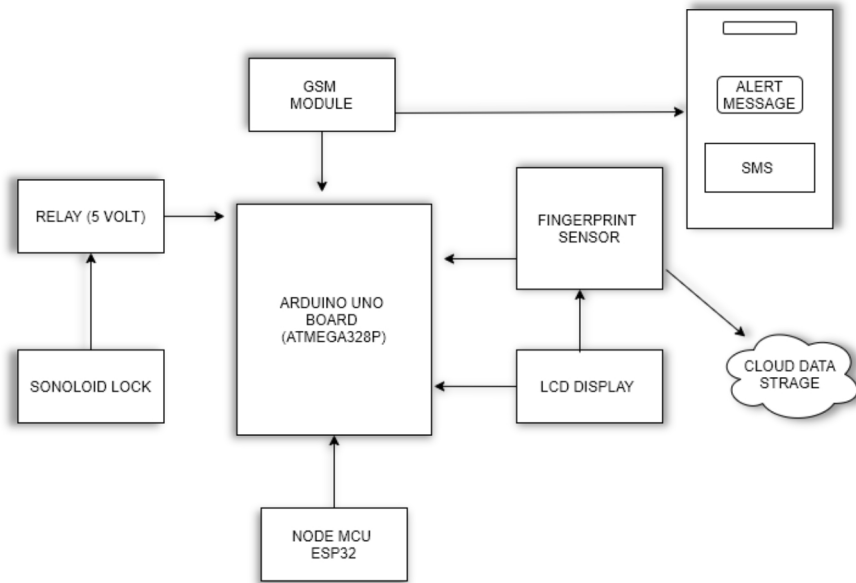
Fig.1. Block Diagram design for DOOR locking system with alert message using fingerprint sensor

4. ARCHITECTURE DESIGN AND SOFTWARE METODOLOGY

The design of the software and architecture diagram as shown in FIG. 2. In this design shows the complete diagram and connection for the project. All hardware requirements connected with the Arduino UNO micro-controller. The enrolled finger prints are stored in Arduino Board. Then check the validation through the finger print and stored in cloud of drive storage.
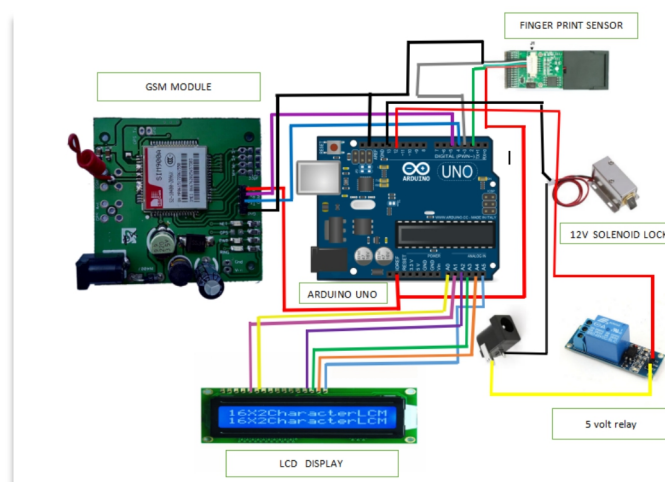

Fig.2. Architecture Diagram for the Door locking system

Fig.3: Use-case Diagram showing the software design and Execution process

Figure:3 give us a detailed outlook on the entire project . To shows a complete Process of the security system. In the Use-case diagram. Step by step process to explained validation of fingerprint sensor. When the system is powered on, the sensor and Arduino board activated. Once, the user place the finger for the validate.

When its matches to stored finger then it will display message on LCD as "Door open welcome home". It does not matches with enroll finger then it shows the message as "Not valid finger print" then, It will send a SMS message to particular register mobile through the GSM module.

5. MODE OF OPERATION WITH SOFTWARE

Fig.4   Code Implementation for Door locking system

In the door locking system we use the two different code for the project. One is used to store and enroll the finger print and saved in the Arduino board.Another code is used to deduct and check the validity of the fingerprint and also modification code is there to delete any finger print. They validity data are stored in cloud. Arduino board have a 127 fingerprint stored data to save the enroll fingers. In figure.4 For this project , The micro-controller of Arduino UNO used a C programming languages.
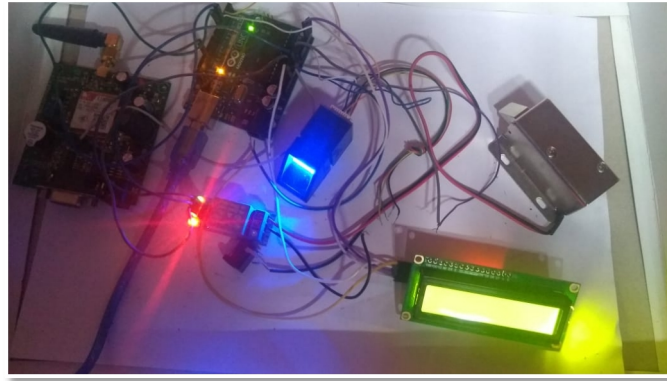

Fig .5: Complete Design project on board with Finger print sensor

Figure.5 was designed on the Arduino board. The programming code are already Written on the Arduino IDE was uploaded and compiled in Arduino micro Controller. All the hardware requirements are connected with Arduino board and now its ready To compile with code.

Fig .6a Display the Message as
 Fingerprint sensor

Fig.6b Display the message as
Waiting for the valid finger print

Figure .6a   LCD screen Display show the text as the fingerprint sensor, It is ready to check the validity . This text shows for 3 seconds after that It shows the text screen as Waiting for valid finger. Now the user can place your finger in the sensor then check the authorized person through Arduino Board.
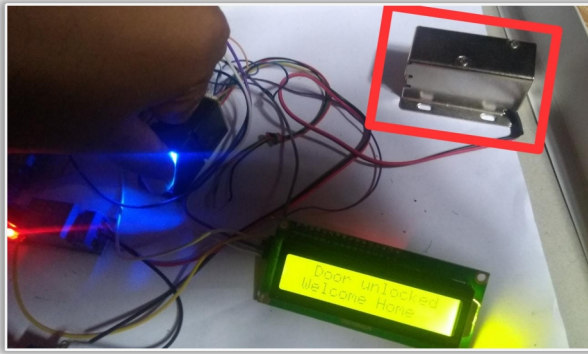
Fig.7a: Door unlocked for authorized Person

Fig.7b: Display message as Door unlocked welcome home

In the figure.7a & 7b , Show as the Micro-controller the after the validity ,If the finger print matches with the stored finger then, Unlocked the solenoid lock with power of 12V Supply and Display the LCD Screen as " Door unlocked welcome home"
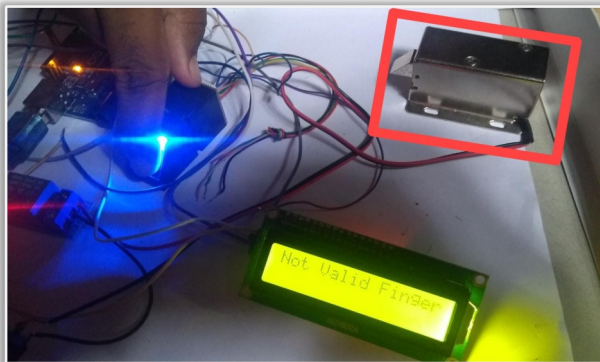Message.

Fig .8a Door locked for Invalid Fingerprint

Fig.8b Display message as Not valid Fingerprint

In the figure.8a & 8b ,Show as the Micro-controller the after the validity ,If the finger print doesn't matches with the stored finger then, locked the solenoid lock with power of 12V Supply and Display the LCD Screen as Not valid Finger print Message.

Figure. 9 shows the Alert text message, When Unauthorized try to access the door locking system then, The GSM module (ESP32) have one SIM is inserted on it board. This GSM module send SMS Alert text message to register owner number.In this Figure.9 can we see the message Send to the authorized person.
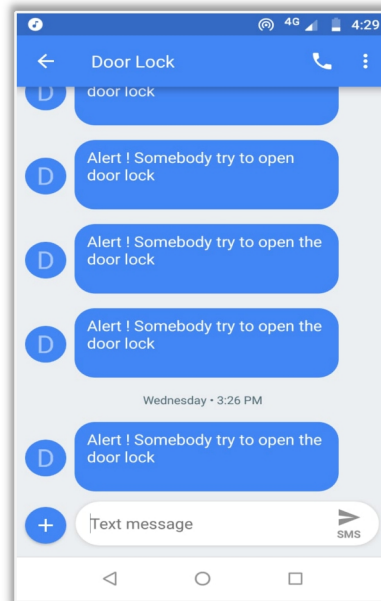
Fig.9: SMS Alert Message

6. CLOUD STORAGE :

In the figure.10 shows the cloud data storage. Node MCU connect the data with Cloud and stored in drive. In the data, user admin can able to see data of the Person who's open the door with time and date. This is the major advantages of the project.

Fig.10 :Cloud Data Storage

7. CONCLUSION :

In this paper , Automatic door locking system with SMS alert is proposed and provide a higher security. The system does not need a any human secure person to protect t and also doesn't required a physical to door lock.The performance of the system is highly reliable and also minimal cost to develop the project with high protection . This system should be placed in the front side of the door and connect the solenoid

Lock.This system fully work with power of electricity and also we change with batteries when suppose user want use any one of this and we can modify it . This is the reason for our system is more reliable when compare with others.

In the future, fingerprint detection can be used for better improvement of home Automation and it gives strong security. It can be wildly used , For Future scope, the device can be paired with a CCTV module to enhance the security. Additional Face Recognition can be installed.

REFERENCES:

[1] Shanthini, M., Vidya, G., & Arun, R. (2020, August). IoT Enhanced Smart Door Locking System. In 2020 Third International Conference on Smart Systems and Inventive Technology (ICSSIT) (pp. 92-96). IEEE.

[2] Raju, N. G., Vikas, J., Appaji, S. V., & Hanuman, A. S. (2018, December). Smart Lock Controlled using Voice Call. In 2018 International Conference on Smart Systems and Inventive Technology (ICSSIT) (pp. 97-103). IEEE.

[3] Bangali, J., & Shaligram, A. (2013). Design and Implementation of Security Systems for Smart Home based on GSM technology. International Journal of Smart Home, 7(6), 201-208.

[4] Jahnavi, S., & Nandini, C. (2019, March). Smart Anti-Theft Door locking System. In 2019 1st International Conference on Advanced Technologies in Intelligent Control, Environment, Computing & Communication Engineering (ICATIECE) (pp. 205-208). IEEE.

[5] Yugashini, I., Vidhyasri, S., & Devi, K. G. (2013). Design and implementation of automated door accessing system with face recognition. International Journal of Science and Modern Engineering (IJISME), 1(12).

[6] Cahyaningtiyas, R., Arianto, R., & Yosrita, E. (2016, November). Fingerprint for automatic Door integrated with Absence and User Access. In 2016 International Symposium on Electronics and Smart Devices (ISESD) (pp. 26-29). IEEE.

[7] Alnabhi, H., Al-naamani, Y., Al-madhehagi, M., & Alhamzi, M. (2020). Enhanced Security Methods of Door Locking Based Fingerprint. International Journal of Innovative Technology and Exploring Engineering, 9(03), 1173-1178.

[8] Nishida, D., Tsuzura, K., Kudoh, S., Takai, K., Momodori, T., Asada, N., ... & Tomizawa, T. (2014, May). Development of intelligent automatic door system. In 2014 IEEE International Conference on Robotics and Automation (ICRA) (pp. 6368-6374). IEEE.

[9] Lwin, H. H., Khaing, A. S., & Tun, H. M. (2015). Automatic door access system using face recognition. international Journal of scientific & technology research, 4(06), 294-99.

[10]Barsha, F. L., Tasneem, Z., Mojib, S., Afrin, M., Jahan, N., Tasnim, M., ... & Islam, M. N. (2019, November). An IoT based Automated Door Accessing System for Visually Impaired People. In 2019 IEEE International WIE Conference on Electrical and Computer Engineering (WIECON-ECE) (pp. 1-4). IEEE.