

FINGERPRINT BASED DOOR LOCK USING ARDUINO

Suyash Gaikwad^{*1}, Sanjiv Jamadar^{*2}, Rupali Shelke^{*3}

^{*1,2}Student, Department of Computer Engineering, MM Polytechnic, Pune, Maharashtra India.

^{*3}Co-Ordinator, Department of Computer Engineering, MM Polytechnic, Pune, Maharashtra, India.

ABSTRACT

This concept which is of Fingerprint door locker is related to the security issues in the day today life, the physical key can be made as duplicate in very cheap cost and the key can lost somewhere or the key can steal, to overcome these issues we can use biometric security gadgets and try improvise the security much more because it can never be stolen it cannot be lost and the stealing chance of duplication are very low to break the security. From the old times the security is the big issue for the company's houses and other places and every person is worried about the security now a days. The traditional door locks can be bypasses by the duplicate keys, but the best solution for this situation is biometric locks which include Fingerprints, Iris and Handprint scanners.so in this project we are going to try to get upper level of security.

Keywords: Arduino, IOT, Fingerprint, Security, Locks.

I. INTRODUCTION

In this Paper we are trying to solve the problems which occurs related to the security in homes, shops and offices. These issues can be fixed by using traditional locks but here a possibility is may occurred of some unknown person will open the lock without breaking it by using duplicate keys. Using these locks also make problems if we lost keys of lock and we have to carry those keys with us. Again, using these patterns in the locks can improve security but again it can open and cracked if somehow someone guesses the passwords or patterns are known. The pattern which can or will used as key will be unique. Here, to implement this project successfully we will use fingerprint as the key. This Arduino NANO project will make use of different devices to the implementation of the advanced security lock where there are different features to maximize the security levels.

II. MODELING AND ANALYSIS

There are primarily four components which are used for the designing of our Fingerprint door lock using Arduino, and they are:

a. Arduino NANO

Arduino NANO is a microcontroller board based on 8-bit at mega328P microcontroller. Along with at mega328P board, This Arduino NANO has 14 digital pins where (out of 6 used as PWM outputs) and 6 analog featured i/o input pins and USB-B type connection port.



Figure 1: Arduino NANO.

b. Fingerprint Sensor

R307 fingerprint module is a finger print sensor with TTL UART interface. The user or owner can store the fingerprint data template in the module and can configure it in 1:1 or 1: N mode to identify the authorized or registered person.



Figure 2: Fingerprint Scanner.

c. Relay Module

This is 1 channel Relay Module. There is no connection between the low and high voltage circuit operated by the microcontroller and the high power circuit which is operated by the microcontroller. The Relay Module protects every circuit from every port.



Figure 3: Relay Module.

d. Solenoid Lock

This DC 12V strong and rigid door lock, Electric Lock Assembly for Solenoid which is used for locking the sell-machine, storage shelves, file cabinets etc. The hidden way of unlocking it is used for an emergency purpose. The lock will work as when the circuits disconnect, and it unlocks as the instant power-on. It is steady, it's durable, and energy-saving relay and had a long lifespan in future.



Figure 4: Solenoid Lock.

III. RESULTS AND DISCUSSION

This IOT based Fingerprint door lock using Arduino, we are showing the components and connected them to the power supply. This system is based for improving the security which will register the owner's fingerprint into the Arduino using the fingerprint sensor, and this system we have given 5v power supply to Arduino

through the code uploading wire. When you put your thumb on fingerprint sensor after registering yourself the lock will be unlocked and you repeat this process again then the solenoid lock will be got locked. The process of locking and unlocking requires less than 1 second so this is why the Solenoid lock is used inside this project.

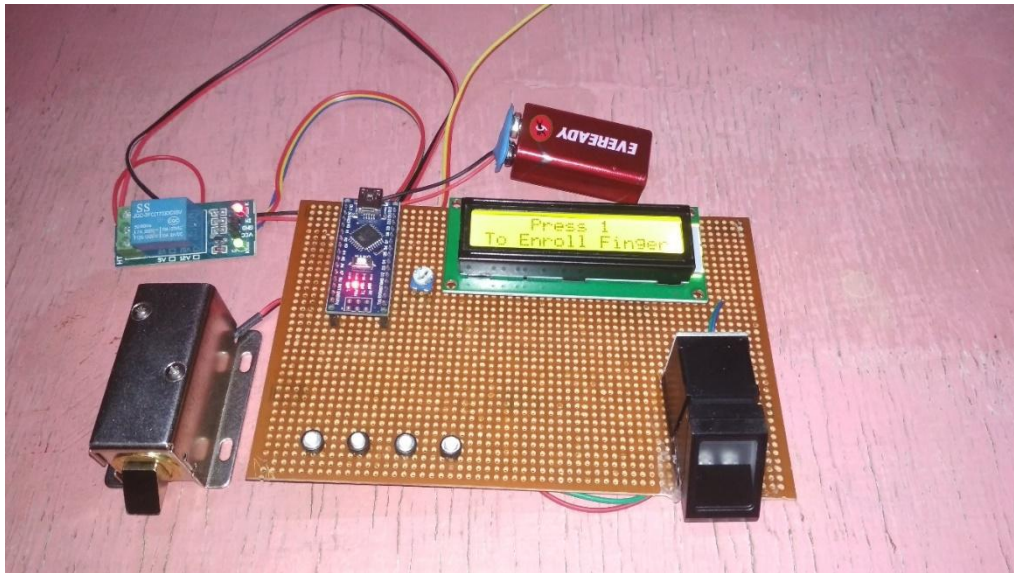


Figure 4: Connected Circuit.

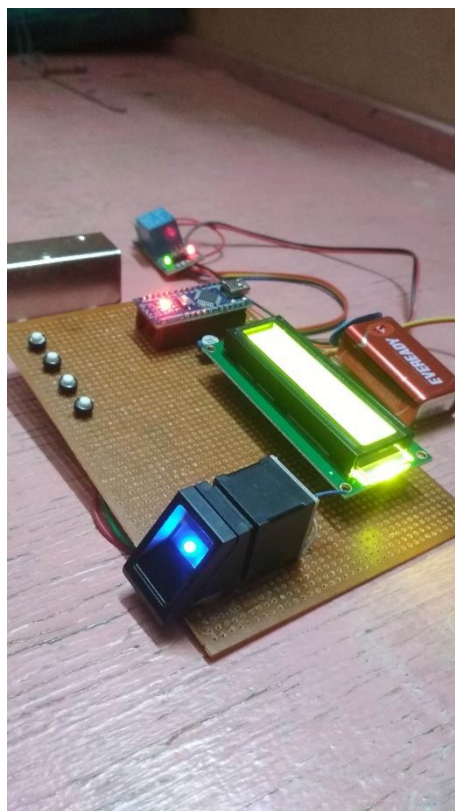


Figure 2: Actual Working Model

IV. CONCLUSION

In this Paper, we have tried to solve the security matters in door locks by bringing the conceptions of biometric fingerprint with the door lock. For that purpose, we are using fingerprint as a rare key to implement device so as to lock or unlock a door lock. This project is going to implemented in multiple applications and this concept

is still in use in the banks but those systems are specially built for those organizations to secure the whole organization and the assured will be very high and other companies and houses.

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