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Fingerprint Based Door Access System Using Arduino

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Abstract - We have designed this project in concern of security. Nowadays security is one of need of human. This paper is based on fingerprint authentication. We have used fingerprint authentication to a door lock. Door will open on the biometric. Every human has its unique biometric identification, so no one can access your home, office, bank without your permission. We have designed this product by using Arduino Nano, R307 fingerprint sensor, relay etc. After implementation this system, not require to Carrie keys, not fear of losing keys as we used to do for traditional locks. So, using Arduino we will try to implement the system with features which will increase the security level.

Key Words: *Arduino, biometric, security*

1. INTRODUCTION

This paper is for making security of house based on our fingerprint. Now days the security is one of the most concerned thing. We have designed a fingerprint based door lock system using Arduino. Today's security can't be fixed using traditional locks because anyone can break the lock or open the lock using duplicate keys. Traditional locks are also dangerous if we forget or lost the keys and always caring keys is another tension to head. If we used pattern type or pin code type locks, that locks can be accessed somehow password are known.

Leaving everything, we will use our self as authentication. We will use biometrics for security which is can't be accessed without self-presence. This fingerprint door lock system will decide who will enter in house office banks, cabin etc. this will increase the security to 99.99% and it's reliable, efficient and profitable.

2. Literature Review

A use of biometric authentication to home, office, banks etc. in security system is a great level of security [1]. Implementation of this authentication is done by using fingerprint sensor and Arduino Nano. "Working Principle of Arduino and using it as a Tool for Study and Research Conference Paper" form this paper we have studied the software and hardware system of Arduino. We used a solenoid door lock [3] by making at home using copper winding and narrow iron pipe.

I have used Arduino Nano instead of UNO to decrease the cost of project.

3. Flow chart of algorithm

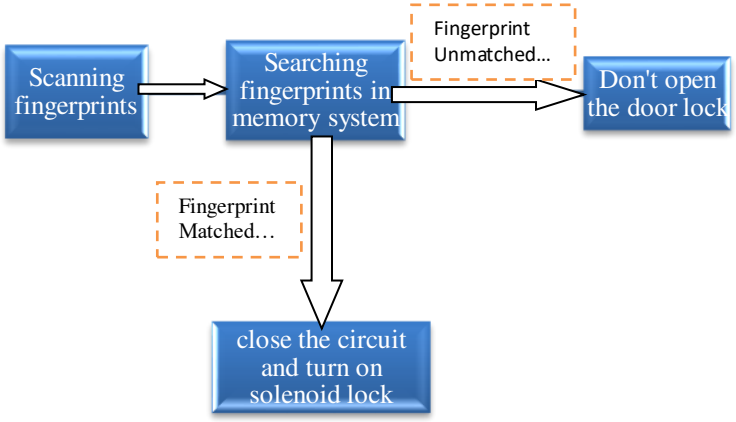

Fig -1: Algorithm Chart

Here simple method is used to achieve this authentication.

1. Place a thumb on a fingerprint sensor.
2. Scans a fingerprint.
3. Searching fingerprints in memory matching to scanned fingerprint.
4. If, found a match, on the relay to open the door lock.
5. If don't found the match, lock remain stable at its original position.

4. Circuit Diagram

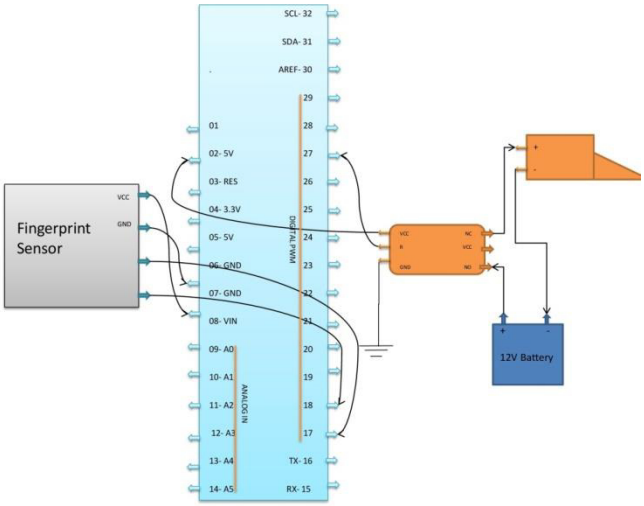

Fig – 2: Circuit diagram of fingerprint based door lock

The connections of circuit diagram are as shown in above fig 2. VCC and GND pin of fingerprint sensor is connected to VIN and GND pin of Arduino respectively. Next two pins of fingerprint sensor is connected to digital pin no. 02 and 03 respectively. This will complete the interfacing of sensor and Arduino.

Here, relay is used as switch. Relay has three pins (VCC, GND, R) to take input. Simply, GND pin is GND connected and VCC is connected to 12V DC supply. R pin is connected to digital pin no. 12.

Finally, the main component that is door lock is connected to 12V DC supply through relay.

5. Working

The Arduino and door lock is connected to a 12 DC supply. When we place a thumb or any finger, which fingerprint saved previously, scanner scans a fingerprint and searches in its database.

If fingerprint matches it send signal to Arduino through pin 02 of Arduino. Arduino will high the relay and relay start which will result in closing of solenoid door lock circuit and door lock opens.

6. Methodology

1. First, install the Arduino software in your laptop, this software is used to merge the codes in Arduino boards.
2. We have to add Adafruit fingerprint library in Arduino.
3. In this you will find out the codes related to fingerprints.
4. Upload the code of enrolling fingerprint in the Arduino Nano. This code is used for enrolling and save fingerprints in memory of sensor.
5. After completion of uploading, using curser open the serial monitor. Here we will assign our fingerprint to a fix ID.
   We can save 127 fingerprints. (Fingerprint Model R307)
6. Now, upload the code of fingerprint detecting. This code will match the scanned print with the saved one. If code matches the relay will high and opens the door lock else won't.

Cost of Project

Sr. No.	Component	Price (INR)
1	Arduino Nano	450/-
2	Fingerprint Sensor	1260/-
3	5V Relay	100/-
4	Solenoid Lock	400/-
5	12V Adopter	100/-
6	Connecting Wires	100/-
Total Cost		2385/-

APPLICATION

1. Home
2. Office
3. Notice board
4. Four wheeler's door

3. CONCLUSIONS

Here, we have tried out to make a world's best security in a very cheap. We discussed about different components and their interfacing.

We have researched through 5 different papers to make best project. We have given algorithm structure, explained circuit diagram and overall cost of this project.

REFERENCES

1. A systematic review on Fingerprint based Biometric Authentication System Hemalatha S School of Information Technology VIT University Vellore, Tamil Nadu, India lshemalatha@gmail.com
2. WORKING PRINCIPLE OF ARDUINO AND USING IT AS A TOOL FOR STUDY AND RESEARCH Leo Louis1 1Department of Electronics and Communication Engineering, Gujarat Technological University, Ahmedabad, India
3. Arduino Solenoid Door Lock using RFID ByAshish Choudhary
4. Fingerprint Based Door Access System using Arduino Malabika Sarma, Amlanjyoti Gogoi,Rahul Saikia, Dibya Jyoti Bora School of Computing Sciences - Information Technology The Assam Kaziranga University, Jorhat, Assam, India