

# FINGER PRINT BASED DOOR LOCK SYSTEM USING ARDUINO

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**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. Here we will use fingerprint for biometric verification as it is one such thing which is unique to every individual.

**Keywords:** Biometric, Arduino, Sensor, Identification, Locking system.

## I. INTRODUCTION

In our daily lives, safety is a major concern. Every person requires a sense of safety. Our security pattern includes an access control system for doors. Traditional locks are no longer as secure as they once were; anyone can gain access by breaking these locks. We need to create a system that will assist 24 hours a day, seven days a week. Only authorized individuals have access to restricted areas thanks to a smart card-based door lock system. Arduino is in charge of the entire system. By scanning the Finger they will get the access to enter.

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. So, a solution to such problems can be by combining door lock with biometrics.

Biometric verification is any means by which a person can be uniquely identified by evaluating one or more distinguishing biological traits. [2] Unique identifiers include fingerprints, hand geometry, earlobe geometry, retina and iris patterns, voice waves, DNA, and signatures. The fingerprint sensor will take the fingerprint of the user and forward it to the Arduino to match with its records. If the print matches with one of the fingerprints of the microcontroller's memory, the microcontroller will lock or unlock the latch, based on its current state. If the fingerprint do not match then nothing happen. The door lock is unlocked and the user have to retry. The system will be reset once a known print will be entered.

## II. LITERATURE PAPER

[1] Meenakshi et al. has proposed "Arduino Based Smart Fingerprint Authentication System". Fingerprint locking system is a locking system that uses a fingerprint sensor module to secure the user's fingerprint. The fingerprint sensor module uses an Arduino or a Raspberry Pi to operate. In the proposed system, there is three-level security. Any two levels of security users have to face to unlock the system. This is the ideal option for avoiding the hassles of a stolen or lost key or illegal access. The authorized user must register his or her fingerprint in the system. The registered person's mobile number is then added to GSM, and a permanent image password is assigned to this user. As a first step, the unauthorized individual must choose unauthorized as the user type.

The admin receives a random picture. The person must properly choose the random image. Otherwise, the system will go back to the first page.

[2] Patil et al. has proposed "Smart Door Locking System Using IoT" The internet of things, or IoT, is a wireless link that works in a door lock. With the help of IoT-enabled applications, the user may unlock the door with his smart phone.

The servo library is introduced after the application is developed by creating a string variable that contains the unique device ID for the lock. The essential concept underlying the door lock's operation is the ID supplied by the Android phone via the created app.

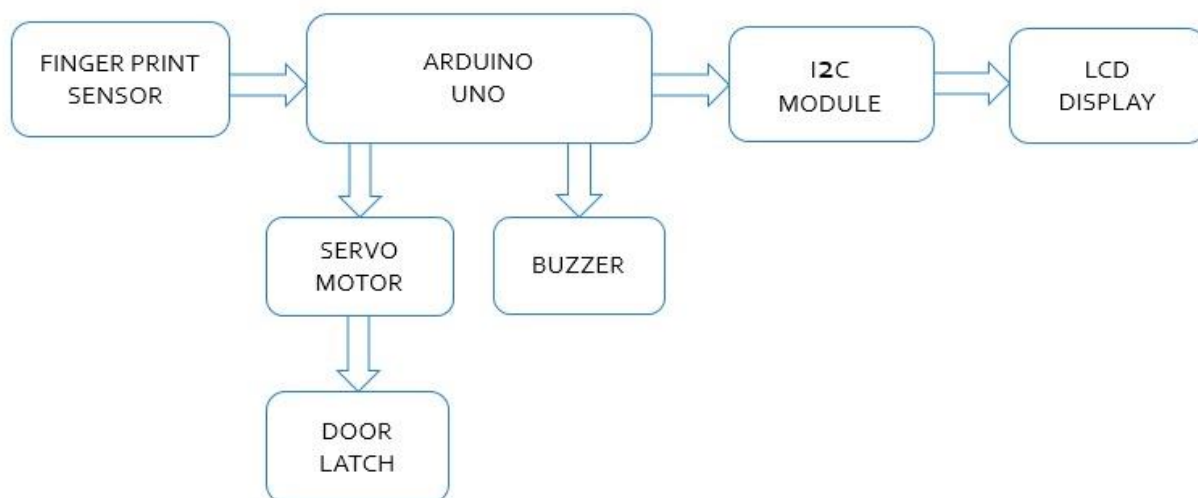
[3] Reddy et al. has proposed “Security System Based on Knock Pattern Using Arduino GSM luggage or other property or item on which device is mounted. This system, which consists of Arduino, GSM Module, Servo Motor, and other components, employs a ‘Secret Knocking Pattern’ that is only known by the owner of the safe, For the lock to open, the knocking pattern must be used only at a certain location, which is only known by the owner. The secret pattern can only be changed after the secret knock has been unlocked. Because there is no key to be copied, this approach fully eliminates the worry of duplication.

[4] Areed and Marwa F. has proposed “A Keyless Entry System Based on Arduino Board with Wi-Fi module, and the PHP programming language to provide access to a closed door. A keyless entry system that focuses on the use of an Arduino circuit board, a Wi- Fi Technology.” The suggested solution, which uses an Arduino Uno board and a Wi-Fi shield to unlock the door without a key, is described. The internet connection allows the system to unlock the door from any place, unlike Traditional systems, which have a limited range.

[5] Kishwar Shafin et al. has proposed “Development of an RFID Based Access Control System in suggested system, which begins the authentication and validation of the user or regulates access in short. the Context of Bangladesh.”

A magnetic door lock is administered through an RFID reader in the In addition, the systems keep track of each user's access and exit records in the form of a Log report for each access. To avoid unforeseen circumstances, the administrator of the central Subsystem can terminate the validity of any user at any moment.

### III. METHODOLOGY



#### A. BLOCK DIAGRAM

Figure 1 represents the block diagram of fingerprint based door lock system using Arduino in which we have used the components like fingerprint sensor, Arduino uno, I2c module, lcd display, servo motor, door lock and buzzer.

#### B. WORKING

When the finger is placed on the finger print sensor, it recognize the finger print and sends the information to the Arduino uno. This checks that the given fingerprint is matching with the input that is given or not.

If the finger print is matching with the given input Arduino sends the signal to the servo motor and the servo motor activates and opens the door look and buzzer will make a beep sound. If it is not matched with the fingerprint the door will remain closed.

## C. FLOWCHART

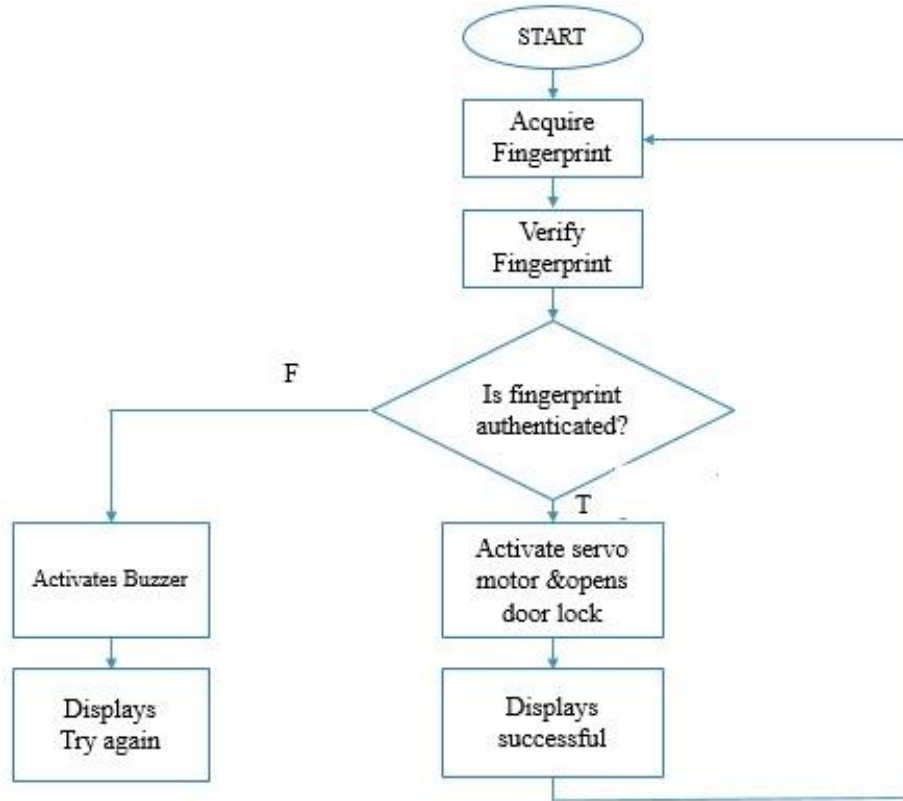


Figure 2 represents the flowchart of the system. When the finger is placed on the fingerprint sensor, it senses the finger and verifies that with the loaded fingerprint. If the fingerprint matches with the loaded fingerprint servo activates and opens the door. If not matched door remains closed.

## IV. RESULTS

The prototype of the proposed system is shown in Figure 3.

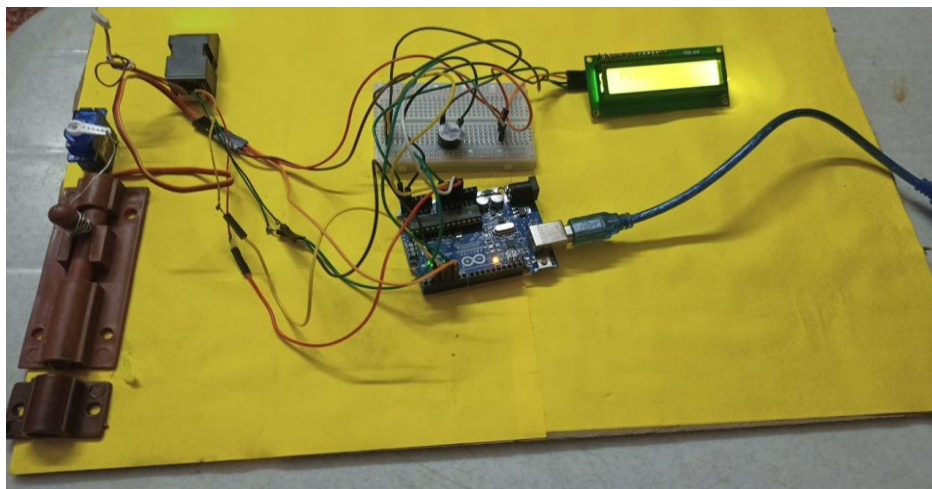


Fig1: System of the project with the complete connections.



Fig 2: Asking the user to place the finger, Which is displaying on the LCD.



Fig 3: As the user placed the invalid finger or the unknown person is trying to unlock the door it is displaying try again on the LCD



Fig 4: As the valid finger is placed, LCD is displaying successful.

**V. APPLICATIONS**

- Residential Security.
- Commercial Buildings.
- Educational Institutions.
- Financial Institutions.
- Residential Rental Properties.
- Schools, Colleges and other residential places.

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