

ADVANCE LOCKER SECURITY SYSTEM

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ABSTRACT

To create an authentication system for locker based on the biometrics. Basically, it is made to prevent the important documents, money, house, etc from thefts. The conventional systems are replaced with the fingerprint module. The recognition of the fingerprint is based on certain factors such as unique patterns, reference points etc. The fingerprint Module has memory storage capacity of 200 fingerprints. As soon as the fingerprint module learn thoroughly the fingerprint, the fingerprint module straightway interacts with the microcontroller and checks if that fingerprint is present in the database of the module or not . For an authorized fingerprint, the locker opens and the user can access their system. If the fingerprint reaped is invalid then a message will be sent to the owner using GSM Module. LCD Display is interfaced with the microcontroller. LCD Display displays the output.

KEYWORDS: *Fingerprint Module, Microcontroller, OTP Pin, DC Motor, Memory Card Reader, etc.*

I. INTRODUCTION

In today's world security is our original job, but most human cannot find the ways to provide security to their confidentially belonging manually. As today biometrics based system provides high degree of accuracy in terms security. Therefore, we have introduced a system for locking which is based on the Finger print scanning. This system provide high security with no manual flaws. This system requires Fingerprint authentication while person who handling the locker and save it is in the memory card which can be viewed later with card reader to the bank authorities. This system consists microcontroller, SD (Secure Digital) card, Fingerprint Sensor, Keypad, Camera Module, DC motor, no. of resistor and capacitor. In this system used the two verification first by Keypad and second by the Fingerprint module. If any unauthorized person access the locker then his/her image capture by the camera.

II. BACKGROUND

Various attempts were made for providing security for all dwells. Up to date, total security is not discovered, because as we are made the new system thieves also find the way for hack system. Fact is that, thieves are becoming more smart than the technology.[1]

Lock and Key System: First step introduced towards security was Lock and key system, "Single key for a single lock". Initially, this system was proved best. But later on, this belief was proved not suitable by the fact that multiple keys can be easily made for a single lock. Hence this system proved an outdated system to provide security.

Password Authentication: Next level of Security is password as an authenticating system. Password of authenticated user is stored in the database. System using password authentication provides respectable security to the users. This system also have a limitation that password is easily guessed.

Authentication by RFID card: Third level of security was authentication by RFID card. This system was enriched with levels of security. Access is granted only for the authorized user whose RFID code

matches with the stored code. But the duplication of RFID card is easily possible and anyone who possess this card can unlock the door.

III. PROPOSED METHODOLOGY

Biometric system includes various things such as face recognition, voice recognition, fingerprint recognition, eye (iris) recognition. Among these techniques the fingerprint recognition is the most widely used because the pattern of friction ridges on each fingers unique and immutable. Therefore, fingerprint is the unique identification for everyone in this world. This technique is best because duplication of fingers is like impossible. Everyone on this earth have different fingerprint pattern, it is different in case of twins also. This system will overcome all the security issues in the present era and provides high degree of security and accuracy. The three basic patterns of fingerprint ridges are the arch, loop, and whorl.

Arch: Arches are found in about 5% of fingerprint patterns encountered. The ridges run from one side to the other of the pattern. There are four types of arch pattern which are as follows –

(i) Plain Arch - In this arch have even flow of ridges from one side to the other of the pattern.

The ridges enter on side of the impression, and flow out the other with a rise or wave in the center.

(ii) Radial Arch – In this arches the slope towards the thumb, have one delta and no re-curving ridges.

(iii) Ulnar Arch – In this arches the ridges slope towards the little finger, have one delta and no re-curving ridges.

(iv) Tented Arch - This arch have an angle, an up thrust, or two of the three basic characteristics of the loop.

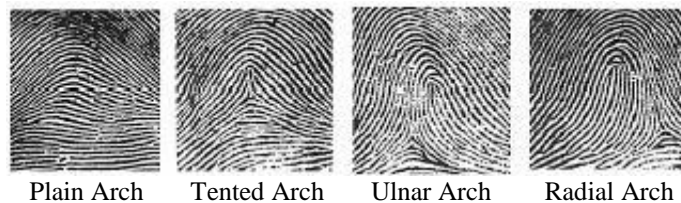


Fig. 1: Arch Pattern

Loop: Loops occur in Fingerprint pattern is about 60-70%. Each loop pattern consist delta, core and ridge count. One or more of the ridges enter on either side of the impression, touches or crosses the line running from the delta to the core and terminate on.

(i) Ulnar Loop – This loops named after the ulna, ulna is on the same side as the little finger and the flow of the pattern in a ulnar loop runs in the direction of the ulna(toward the little finger).

(ii) Radial Loop – This loop named after the radius, mainly found on the index finger. In this loop flow of the pattern runs in the direction of the radius(toward the thumb).

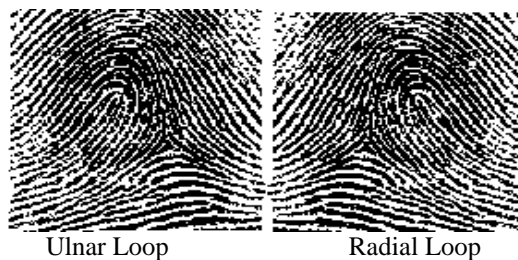
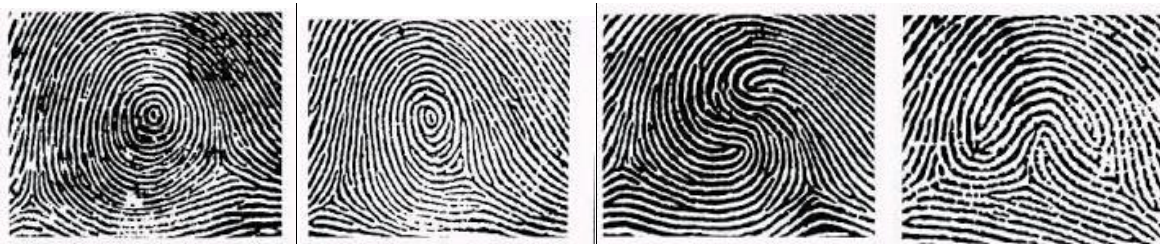


Fig. 2: Loop Pattern

Whorl: Whorl occur in fingerprint pattern is about 25-35%. Any fingerprint pattern which contains two or more delta will be a whorl pattern. There are four types of whorl pattern.

(i) Plain Whorl – This Whorl consist one or more ridges which make or tend to make a complete pattern with two delta.

- (ii) Central Pocket Whorl – A Central Pocket loop whorl consists of at least one recurring ridge, or an obstruction at right angle to the line of flow, with two deltas, between which, when an imaginary line is drawn, no recurring ridge within the inner pattern area is cut or touched.
- (iii) Double Loop Whorl – A Double Loop consists of two separate loop formation with two separate and distinct sets of shoulders and two deltas.
- (iv) Accidental Whorl – A Accidental whorl consists of a combination of two different types of pattern with the exception of the plain arch, with two or more deltas or a pattern which possesses some of the requirements for two or more different types or a pattern which conforms to none of the definitions.



Plain Whorl Central Pocket Whorl Double Loop Whorl Accidental Whorl
 Fig. 3: Whorl Pattern

IV. PROPOSED MODEL OF THE SYSTEM

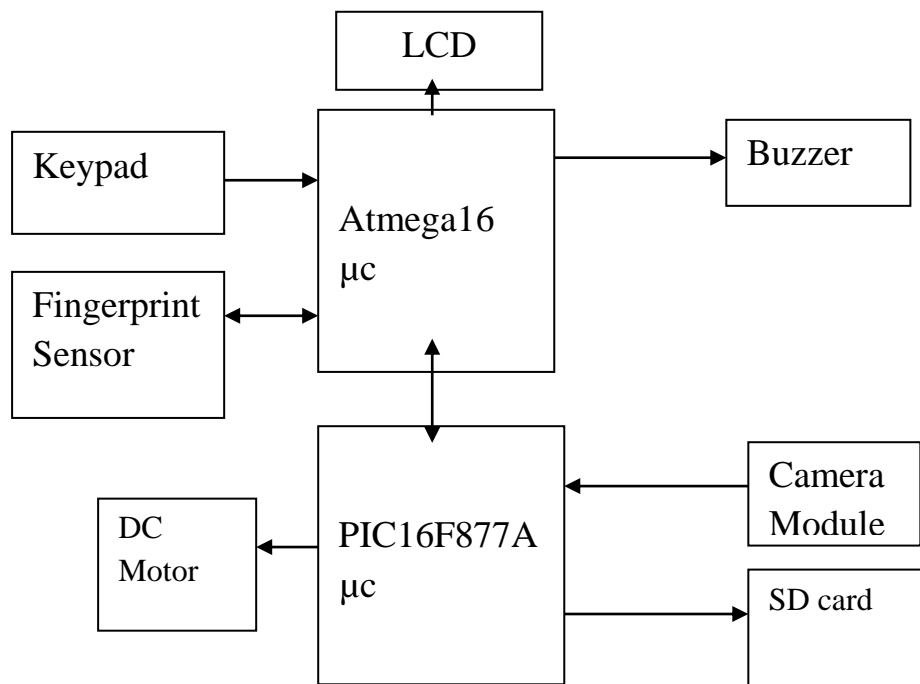


Fig 4: Block Diagram of Advance Locker with High Security System

Circuit Diagram

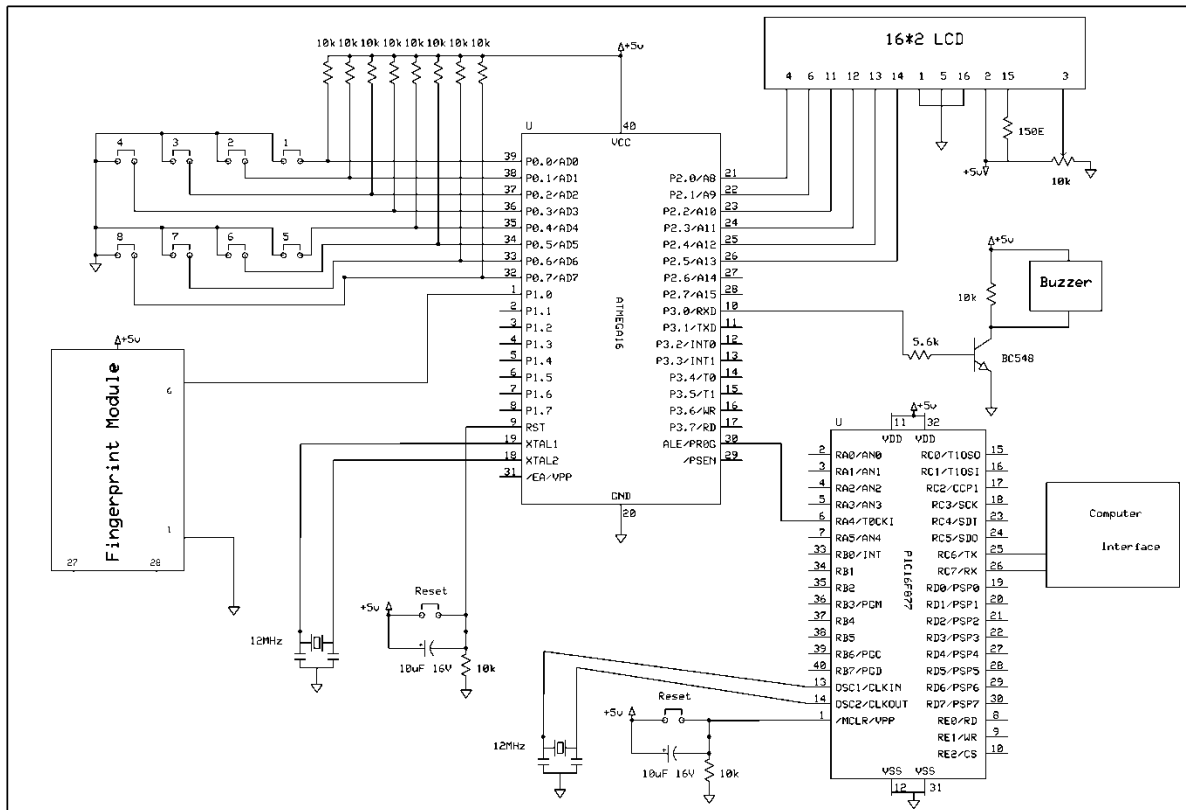


Fig 5: Circuit Diagram of the Advance Locker with High Security System

WORKING -

Our project is a two-step verification system, which includes password and fingerprint authentication system. It also includes the image capture of the unauthorized user. Stepwise working of the project is given below:

- Step 1: Enter the password by keypad.
- Step 2: Now, scan your finger on the fingerprint scanner. If your fingerprint is not matched then image capture by the Camera module and store in the SD card.
- Step 3: If the password and fingerprint are right then the door attached to the dc motor will open.
- Step 4: Now, you can use your locker.

V. THE MAIN ADVANTAGES OF USING THIS SYSTEM

- 1. Easy to use and requires no special training or equipment.
- 2. Fingerprint is unique for every person it cannot be imitated or fabricated . It is not same in the case of twins also.
- 3. High accuracy in terms of security.
- 4. No manual errors.
- 5. No false intrusions.

VI. APPLICATIONS

- 1. Home Security System
- 2. Office locking
- 3. Bank locker
- 4. Police station
- 5. Various Mall & Shops

VII. FUTURE SCOPE

As the cases of theft of confidential belongings increasing day by day, so this fingerprint based locker will overcome all the security related manual flaws. Because duplication of fingerprint is impossible. In future we can introduce this project in vehicles also, thumb recognition will help for starting the car and a speaking voice alarm can be used to indicate unauthorized person accessing the locker.

VIII. CONCLUSION

From this review paper we concluded that, as we are moving in the world of advancement, there is a great increase in the theft of confidential belongings in today's world. This project provide a high degree of security. This is commercial and anybody can easily afford this.

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