

An Innovative Tap lock Mechanism For Home Security Using Finger Print Technology

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Abstract- As we are moving in a World of advancement, so the security is the major concern in order to keep data isolate from the unauthorised users to access. In today's World, we need high degree security system for the protection of our document, important data, as well as memory and jewellery. This review paper presents a secure fingerprint locker which is feasible. This system is proved successful on all norms of security of lockers. There are other methods of verifying authentication through password, RFID but this method is most efficient and reliable. To provide perfect security to the lockers and to make the work easier, this project is taking help of two different technologies, i.e. Embedded System and Biometrics. Biometrics is basically the measurement and use of unique characteristics of living beings to make them distinguish from one another. And this is more reliable than passwords and tokens which can be lost or stolen by the humans. In this paper we are providing the work done on this technique.

Keywords- Fingerprint Module, Intrusion Detector, Microcontroller, OTP Pin, DC Motor, Memory Card Reader etc.

I. INTRODUCTION

We as a whole realize that the security is our own essential activity in this day and age, yet most human can't discover the approaches to give security to their secretly having a place physically. As today unique mark based framework gives high level of precision in wording security. Thusly, we have chosen to present a framework for locking which depends on the Finger print examining. Our venture will furnish high level of security with no manual defects. Our undertaking fundamentally, is a mix of Embedded Systems and Biometrics. An Embedded framework is a blend of PC equipment and programming, for example programming is executed on the equipment which has a key trademark that it is committed for the specific assignment. Configuration engineers upgraded the size and attributes of the microcontrollers, the expense of the item likewise diminished which make it business. Essentially, installed framework is "Continuous Operating System" which gives yield

immediately. In unique mark locking framework there is gigantic interest of fast working frameworks which is satisfied by inserted frameworks. This paper incorporates unique mark distinguishing proof, in this we are clarifying the working of unique finger impression module and it's working. Next comes, Literature Review in which we consider nine papers and concentrate the working standards of various papers. For the correlation of writing audit papers we make an examination table. The finish of the papers comes after this table and afterward we notice the thirteen references.

"Fingerprints are made of a series of ridges and furrows on the surface of the finger and have a core around which patterns like swirls, loops, or arches are curved to ensure that each print is unique. An arch is a pattern where the ridges enter from one side of the finger, rise in the centre forming an arc, and then exit the other side of the finger. The loop is a pattern where the ridges enter from one side of a finger, form a curve, and tend to exit from the same side they enter. In the whorl pattern, ridges form circularly around a central point on the finger. The ridges and furrows are characterized by irregularities known as minutiae, the distinctive feature upon which finger scanning technologies are based. Minutiae points are local ridge characteristics that occur at either a ridge bifurcation or a ridge ending. The ridge ending is the point at which a ridge terminates. Bifurcations are points at which a single ridge splits into two ridges. The basic principle of this system is based on fingerprint authentication system. There are mainly two types of scanning methods available for this authentication technique. These are optical scanner or capacitance scanner is used to scan and generate a picture of the user's finger. Though both the methods generate the same type of image but the making is completely different."

Tapplock is only the world's first padlock which is very smart to access without a key or smartphone or any kind of combination code. Tapplock has a combination of secure hardware and software technologies. It comes in two versions that is tapplock and tapplock lite, where tapplock lasts for 3 years and the tapplock lite lasts 6 months durability[8] It can store up to 200 fingerprints Unlock time is not more than 0.8

seconds Sensor used is FPC 1020 sensor and Bluetooth v4.1 can also be used to unlock the lock The tapplock measures 85*55*30mmThe tap is about charge a standard smart phone up to 70% of the phones battery at the same rate as standard battery packs on the market Tapplock is approximately the same weight as your standard Dudley or master lock padlock, about 200grams.Tapplock prototype works only on the android OS. However, we will have IOS and windows app when the product is shipped to use the app, we recommend having a smart phone with either android or Ios, Bluetooth 4.1

II. RELATED WORKS

Aditya Shankar et. al focused in this project on the replacement of conventional techniques of locking system. They replaced the old methods like lock & key system and password authentication system by the biometric system. They basically used fingerprints for the authentication system, the person whose fingerprint saved in the database can easily access the locker. They also provide an alarm system to alerting the neighbours if an unauthorized person or thief tries to access the locker. To prove that person authorized to open the locker door they need to scan their fingerprint images. The scanner is interfaced to 8051 microcontroller; this controller will be controlling the scanning process. They also provided a keypad for password after the fingerprint scanning. This two step verification is for the double security. And a buzzer is provided for alarm in case of unauthorized access of locker. [1]

Omidiora E.O. et. al refused the traditional methods of locking system for the bikes, they introduced finger print based locker which is the robust security mechanism in various security domain. In their prototype software module is used for the database storage of valid users and hardware is provided for the interfacing. Programming was done with the help of Visual Basics, Visual C and Visual C++. The programming of this prototype was done in Visual Basic 6.0 Enterprise Edition. The prototype was tested with 20 test images stored in the database. The implementation was successful and the microcontroller was clearly differentiated between authorized and unauthorized users. Logic 1 transferred for authorized user and logic 0 for unauthorized user. [2]

Karthikeyan. A et. al told that every person has unique fingerprint. They added a secured keypad for adding and deleting number of users from database which is very good concept. FIM3030 fingerprint module by NITGEN is used in this purpose. For controlling the whole driving unit Microcontroller AT89C52 is used. LCD is also provided for showing the information about the authorized and

unauthorized user. Decoder DM742S138 is provided for data routing and for interfacing with fast memory units as the decoder have short propagation delay. Latch 74HC373 is provided which is highspeed Si-gate CMOS devices. A relay is used as an interfacing circuitry between the microcontroller output and the ignition system of the car. [3]

Pavithra .b.cet. al mainly focused in this project on security. They used R303A as a scanner. This module has in-built ROM, DSP and RAM. The fingerprint module has a capacity of storage 100 user's fingerprint. This module operates in 2 modes they are Master mode and User mode. Master mode is used to register the fingerprints which will be stored in the ROM present on the scanner with a unique id. They provided a unique identification number for the last step of verification, which provides three wrong attempts. They provide a digital code lock at every locker's door, which is operated by the password. The password included six mandatory numeric numbers without any character. This locking system is interfaced with microcontroller for the password storage and verification. This lock consists of a LCD screen, keyboard and a microcontroller 8051. This can be implemented at every door locker because it is commercially available. [4]

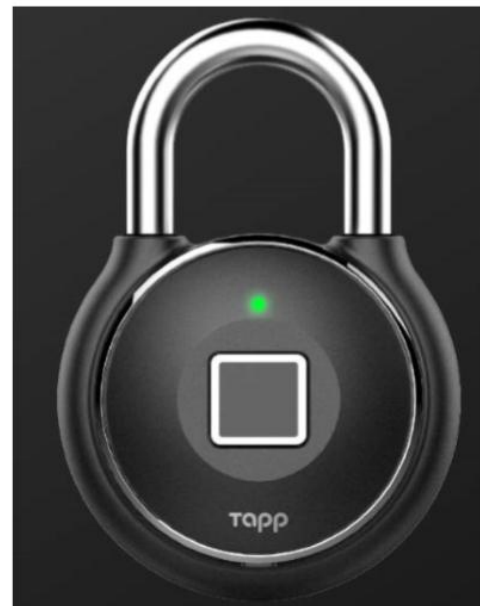


Figure 1 : Unbreakable TappLock

III. PROPOSED FRAMEWORK

This segment gives a fundamental prologue to fingerprint acknowledgment frameworks and their primary parts, including a concise depiction of the most generally utilized systems and calculations.

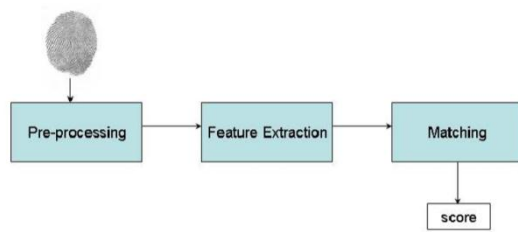


Figure 2: Finger print Verification System

The main modules of a fingerprint verification system (Fig. 2) are:

- a) **Fingerprint** sensing, in which the fingerprint of an individual is acquired by a fingerprint scanner to produce a raw digital representation;
- b) **Pre-processing**, in which the input fingerprint is enhanced and adapted to simplify the task of feature extraction;
- c) **Feature extraction**, in which the fingerprint is further processed to generate discriminative properties, also called feature vectors; and
- d) **Matching**, in which the feature vector of the input fingerprint is compared against one or more existing templates. The templates of approved users of the biometric system, also called clients, are usually stored in a database. Clients can claim an identity and their fingerprints can be checked against stored fingerprints.

IV. WORKING WITH A FINGERPRINT SENSOR

CAMA-AFM31 Fingerprint module with FPC 1020 sensor for security lock framework is capacitive unique mark module for optional advancement. It can distinguish live fingers and decline counterfeit fingers, which has a place with higher security level contrasting and optical ones.

CAMA-AFM31 unique mark module with FPC1020 sensor for security lock framework includes little size, low power utilization, straightforward ports, high dependability, little unique finger impression layout, extensive finger impression limit, and so forth it is helpful to be implanted to client framework for acknowledging customers required unique finger impression check items.

CAMA-AFM31 Fingerprint module with FPC1020 sensor for security lock framework remarkably includes selflearning capacity. Amid the unique mark check process, the most recent gathered finger impression highlights would be coordinated into the unique finger impression database

consequently with the goal that the client would get better and better unique finger impression confirmation result.



Figure 3: CAMA-AF 31 Finger Print Module

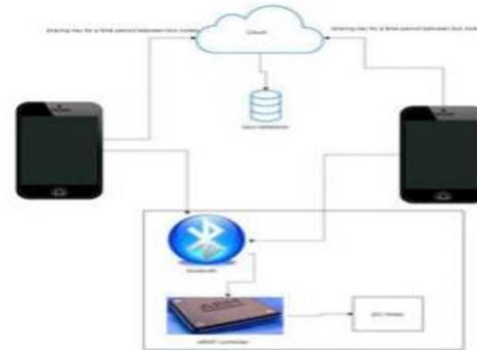


Figure 4: Design of Bluetooth 4.1

The equipment on the entryway utilizes a microcontroller to control a straight actuator that goes about as the locking system. The Bluetooth [5] convention was picked as a specialized technique since it is as of now coordinated into numerous Android gadgets and is verified through the convention itself. It additionally fit well into the structure necessities of the undertaking for a short range, remote association strategy. Our savvy lock framework will work over remote system like Bluetooth.

V. CONCLUSION

This is a Future Scopable task this paper gives essential thought of how to control security utilizing the brilliant systems. We can utilize the latch framework as in entryway and open air key lock framework. The framework is structured to such an extent that the client can just open the lock by his unique mark and utilizing Bluetooth system by his advanced mobile phone. So it enables us opportunity to access without key or blend codes utilizing this latch there is no danger of losing keys or mix code or overlooking locks picked on the grounds that the lock is in our grasp dependably that is our unique mark.

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