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# BIOMETRIC FINGERPRINT AND SECURITY

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*Abstract*— **A fingerprint authentication system plays an important role in today's era which is one of the commonly  used biometric system used by humans to verify the identity of a person. Even features of a person such as face, signature can change with time, but a fingerprint of any individual is unique and removes unchanged or same for lifetime. A biometric system contains various modules such as image capturing module, a pattern matching module and a feature extraction module.**
**In various authentication system we need to remember a password or a pin but biometric system does not  require so. A biometric trait cannot be forgotten ,lost or stolen .so these are widely used in today's world. This paper defines the various methods which are to be used for identification and how it is to be secured.**

*Keywords*—  **: fingerprint authentication system, biometric system, image capturing module,  pattern matching module ,feature extraction module.**

## I. INTRODUCTION

Finger reader is a device that assist visually impaired users with reading texts or words. It is basically a ring that rouses a tiny camera  and some haptic actuators  for feedback. when such person wants to read any text around them,they point their finger at the surface with the text and the device reads the words out loud.Indeed ,finger reader is a proof of concept prototype.A lot more  work needs to happier to make this into an easy to use,reliable for making  it more commercialized and useful.The research lab at the MIT media lab is focused on developing more natural user interface. People with a vision impairment  naturally rely on tactile feeling through their fingers to read.This approach is discovered to help these impaiement. It is clear that today's personal gadgets are disruptivein their use. Finger reader would obviously be one of the source in solving the problems of these people.

Information security is concerned with the assurance of confidentiality ,integrity and availability of information in all forms.Biometric authentication supports the fact of identification,authentication and non repudiation in IT security.Biometric is used to identify the identity of an input sample when compared to a template ,used in cases to identify specific people by certain characteristics.The advantage claimed by biometric authentication is that they can establish an unbreakableone-to-one correspondence between the individual and a piece of data

## II. DIFFERENT BIOMETRIC TECHNOLOGIES:

Various  biometric technologies include:

1. **FINGERPRINTS:** A fingerprint is made of ridges and valleys on the surface of fingertips. Upper skin layer segments are called ridges and lower skin layer segments are called valleys.
2. **DNA:**  A biometric identification is obtained by examining arrest of the part so the pattern is recognized and than it is converted into computer code and get stored into database.
3. **VOICE RECOGINITION:** It is the identification of a person from characteristics of voice such as tone,pitch and frequency.it can be affected by bad throat and in that condition system will not be able to recognise the person.

RETINAL SCAN : it is used to map the unique pattern of a person's retina.it is performed by casting an unperceived beam of infrared light into a person's eye.Retinal blood vessels are more absorbent of this light than rest of the part the pattern is recognized and it is converted into computer code and get stored into database.

### III. ADVANTAGES OF FINGERPRINT BIOMETRIC SYSTEM :

1.The finger reader gives real time feedback on the progression of the scan example- staying in the line, angling the device, etc. where solutions that focus on capturing a whole page or block of text mostly do not.

2. This device maintains the connections of the finger to the medium by instrumenting of well practiced gesture of using the index finger to trace written text, and the tactile feeling of the paper at the tip of the finger.

3.The finger reader algorithm specializes in reading multiple words essentially a whole line of text and not a single word like a reading pen.

4.Finger Reader works with existing personal technologies e.g. Smartphone ,mobile phone and tablet ,which are already utilized by people with impairments of all kinds ,thus it doesn't require purchasing additional hardware.

### IV. DISADVANTAGES OF FINGERPRINT BIOMETRIC SYSTEM

1.Performance can be deteriorate by dust, oil, water on the finger surface.
2.Cannot be used in chemical industry and hospitals because chemicals used on hands can change the fingerprint pattern.

3.It is more associated with forensic.

4.Loss of privacy and security.

5.The problem of artificial gummy, or fake fingers.

### V. SECURITY USING FINGERPRINT RECOGNITION

The analysis of fingerprints for matching purposes generally requires the comparison of several features of print pattern.these include patterns,which the aggregate characteristics of ridges and minute points,which are unique features found within the patterns.in whole pattern ,ridges form circularly around a centred poingt on the finger.
1.FINGERPRINT SENSORS: A fingerprint sensor details of which can found in captures the digital image of fingerprint pattern called live scan.this live scan is digitally processed to create a biometric template which is stored and used for matching. The commonly used fingerprint sensor technologies are optical ,ultrasonic and capacitive.
2.SWITCHING FINGERS: One of the solution is that if someone stole copy of our fingerprint scan than we can change the identifier nine times by switching fingers.One of the benefit of this solution is that no more hardware is required in it.One of the issue with this solution is that it requires large databases.

### VI. Conclusions

This paper helps to present the detailed information about fingerprint biometrics and at last we discussed some of the solutions of issues related to the privacy and security of fingerprint biometric so we concluded that fingerprint biometric has many advantages such as cost, robustness, reliability, accountability and

efficiency. This is one of the cheapest biometric solution and easy to operate as well. The possibility of defeating this technology is fake fingerprints and lost of privacy and security. From this study it is concluded that  more work need to be done in fake fingerprints and the issues related to theprivacy and security in database. So it is very necessary to make fingerprint biometric more sophisticated   by developing new fingerprint sensors with increased security having improvements in False Rejection Rate.(FRR).It is also necessary to work in fields of secured database technologies  so that it can be prevented from hackers to attack.

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