

Review Paper on Biometric Authentication

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Abstract: A biometric system is pattern recognition system to person recognizes by considering the specific characteristic as physiological and behavioural possessed by that person. There are several factors that cause different types of biometric samples, including image features that attribute to the effects of these differentiation, are discussed. Biometric applications have the ability to offer more option for authentication or identification security than the traditional systems, it has created even secure system requirement which could resolve the security related issues.

Keywords: Biometrics, Authentication, Fingerprint, Eye Scanning, Face Recognition

I. INTRODUCTION

Biometrics comes from the word's 'bio' meaning Life and 'matron' meaning Measurement. Biometric is method of identification or authentication of a person by the measurement of some unique traits of the person. By using the unique characteristics of person like fingerprint scan, facial imaging, signature, voice recognition etc are the biometric identification is done. Biometric provides better reliability than the traditional PIN or any other Identity based system as:

1. Biometric authentication is differentiated into two characteristics:
 - a. Behavioural characteristics
 - b. Physiological characteristic
2. There is no need for a person to carry identity card or remember any passwords etc.

The biometric systems can be traced through the evolution of scientific inquiry, empirical evaluation and classification of a given physical or behavioral characteristics into sub-types

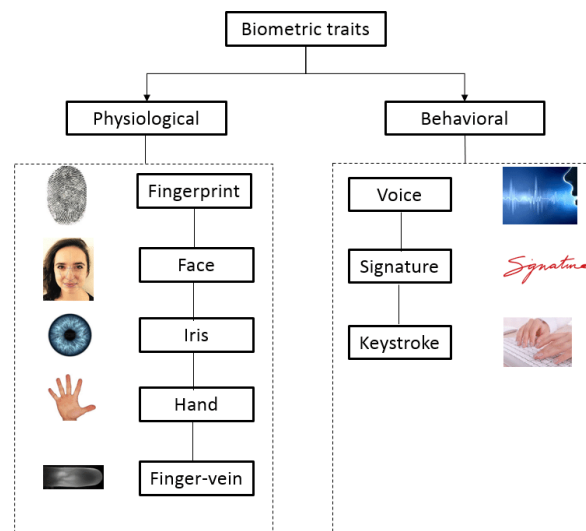


Figure: Classification of biometric

II. FINGERPRINTS IDENTIFICATION

It is oldest Biometric technique used. The digital imaging of fingerprints is carried out in this method. This scans the friction ridge of skin or fingers impression of the human. The sensor senses the unique curves, bifurcations of the fingers.

2.1 Eye Scanning

There are two different methods for eye recognition:

1. **Retina scanning:** when the user has to look into the device, the device will scan retina by laser-scanning. Then the blood vessel which is unique will be configured by the device.
2. **Iris Scanning:** iris scanning is different from retinal scanning because there is no need for the user to stand near the device. In iris scanning, the camera does the imaging of iris. The image which is obtained is analysed by the device. No updation of image is required because iris is stable throughout life.

2.2 Face Recognition

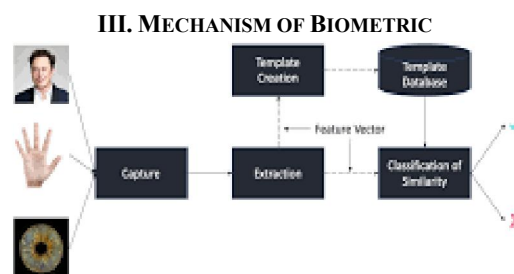
In face recognition, simple camera or a web camera having good resolution is used. Facial recognition in visible light obtains features from the central portion of face. These characteristics do not change. Some superficial features like facial expressions, hairs are avoided. There will be an existing database which is used for comparison of the representation, and if it is matched, the user is authenticated.

2.3 Handprint Imaging

In the handprint imaging method, the picture of a person's hand will be scanned. Features like distance between the fingers, length of the fingers, length of the hand are obtained and saved.

2.4 DNA Analysis

The DNA analysis method of verification is used in criminal cases. DNA of a person is collected in the form of blood, tissue, hair, nails etc for confirming. DNA analysing takes time. DNA is a unique character for each and everyone but a hair or nail can be stolen.



3.1 Technological Opportunities of Biometric Recognition System

The biometric recognition system is a system that operates by acquiring data from a person and then does operations like pre-processing, segmentation, extraction of the features which is set and compared with the database which is stored.

Some technical opportunities are discussed below:

1. **Sensors** – The cost of sensor hardware is improving the signal-to-noise ratio, the ease of use and affordability, and the duplicability of measures.
2. **Segmentation**– It improves the reliability of identification of a region of interest when the person presents his or her biometric characteristics
3. **Invariant representation**–Finding better ways to obtain features from the inherently varying biometric signal that is, what kind of digital representation should be used for a face or fingerprint or other features.
4. **Privacy**–Advance technology will enable to benefit from unique advantages while there will be less risk to privacy.

3.2 Advantages of Biometric Authentication

1. There will be no need to remember the passwords or login ID's.
2. Time and resources can be saved.
3. Person can access to their personal data or accounts.

3.3 Disadvantages of Biometric Verification

1. Some methods can be limitation for physically challenged people.
2. The system will show error due to change of amount of light entering the eye pupil which may lead to contraction.
3. The retina scanning is expensive because the DNA analysis takes time.
4. Some features of face or palm may change with time and age

IV. CONCLUSION

Nowadays biometric data extraction can be easily achieved without the need for specific sensors; therefore, its implementation can be low cost when taking advantage of modern technologies, such as mobile devices equipped with embedded cameras for facial reorganization or fingerprints.

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