



Biometrics

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Introduction

Biometric is a combination of two parts which is 'bio' a Greek word means life and 'metrics' means measurement. Biometric is a way of technology which collects all those information's of a particular individual and establish it for personal traits of an individual. The biometric provides a high accuracy of identification and security protection to the particular identified information from the individuals.

Definition

Biometric is a branch of information technology used to recognize, analyze and measure the physical and behavioral characters. Every person has a unique character from their birth. Which can make the person outstanding from the rest of other persons. The physical characters are finger prints, color of eyes, hair color, hand geometry, tone of speech, hand writing, using different spelling in computer key boards and etc. the unique characters are used to manage the and identify a responsible individual or owner of the data:

- Identification
- Verification
- Authentication
- Protect ethical handling

Biometric system

The system which can takes a particular individual's information physical and behavioral characters as an input and identifies, analyze and measure to catch the genuine user or malicious user.

Evolution of biometrics

Biometrics evolution begins from the 14th century in China. The China government collects the finger prints of merchants and their children to separate them from others. This method is still

in working. In 19th century Alphonse Bertillon who was an anthropologist found a method of taking a body measurement. which is differ from other individuals such as length of hair, hair color, weight etc. some physical characters are remains unchanged length of fingers but the quality of the method is reduced because of the person having same body measurement can mistakenly spell the wrong person.

Retinal identification was coined by Dr. Carleton Simon and Dr. Isadore Goldstein in 1935. From 1976 research effort developed the first retinal identification system by Eyedentify Inc. the first commercial scanning instrument was available from 1981.

Iris measurement system was invented by John Daugman in 1993 at Cambridge University.

In 2001 BAT biometric automated toolset was introduced.

Biometric requirement

The usage of biometric is applied in various fields such as medicine, banking, science. The immense need of using the biometric is to protect the data and information from the unauthorised user.

- i) **Authentication:** This step is just like a selecting a answer for a question or matching the suitable answer for the question. Which can compare the input data with the whole data present in the particular database.
- ii) **Verification:** This protocol is a eye to eye. Matching the presently available sample which is inputted by an individual and compared by already stored data. When the information is matched with 70% of previously stored data the verification is successfully completed.
- iii) **Authorization:** It is a process of assigned a work or quires to authorize the user. It is just like a writing an answer for a question.
- iv) **Conventional security aids:** These conventional methods have some of the security items such as user ID, password, and personal identification numbers (PIN). Some disadvantages of this conventional methods are:
 - Forgotten
 - Stolen
 - Missed
 - It can be bypassed and compromised
 - It cannot precise

Basic components of the system

The biometric system has four major components. They are:

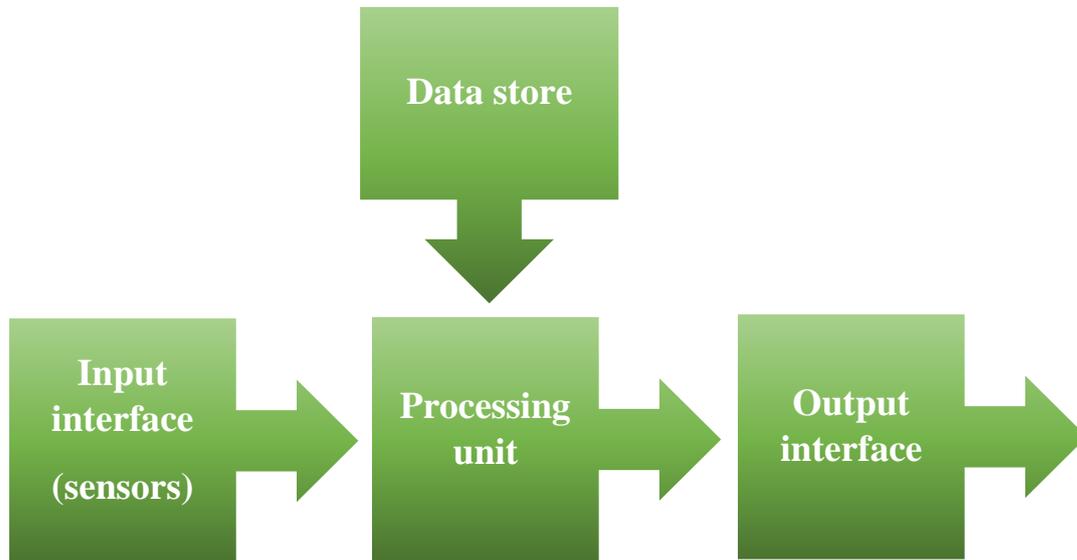


Figure: components of biometric system

Applications of biometrics

There are three main applications present in the biometrics, they are:

- i) **Commercial:** The commercial applications of biometrics are network sign in, data protection, e-commerce, internet accessibility, ATM's, credit card, physical access control, phone, PDA, medicinal records management, distance education.
- ii) **Government:** Applications such as national ID card, correctional facility, driving license, social protection, welfare disbursement, border control, and passport management.
- iii) **Forensic:** usage such as corpse identification, crime investigation, terrorist recognize, parenthood determination, and missing peoples.

Limitations

The introduction of biometric system in various fields does not imply that biometric is a completely solved problem. it is helpful that there is a numerous number of uses and scope for improvement in biometrics. Researchers are not only focused in decreasing the error rate, but they are also focusing to increase the usability of biometric system.

Biometric systems that operate using any single biometric characteristic have the following limitations.

- Mistake in sensed data.
- Intra class variations.

- Distinctiveness.
- Nonuniversality.
- Spoof attack.

Reference

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