A Various Biometric application for authentication and identification

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Abstract: In today's environment, biometric are play important role for the security purpose .with the help of different type of biometric thief can be easily caught. Various type of physical and behavioral biometric used for the authentication and identification purpose. Physical biometric are most popular and give the highest accuracy rather than behavioral biometric. These biometric are used according to requirement like field where we want to use, cost, and accuracy. Different special devices are needed for using the different biometric. In this paper shows different types of biometric are available in the world with their merits and demerits.

Keyword: Authentication, Biometric, Biometric parameter, feature extraction, identification

Introduction

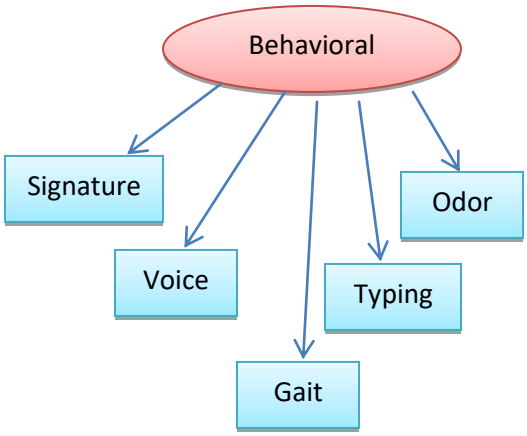
In present days various type of methods used for the safety purpose. Safety is required from home to nuclear power plant. Generally, achievement of best results in low cost is primary goal. Normally, different ways are followed for the safety purpose like [1]:

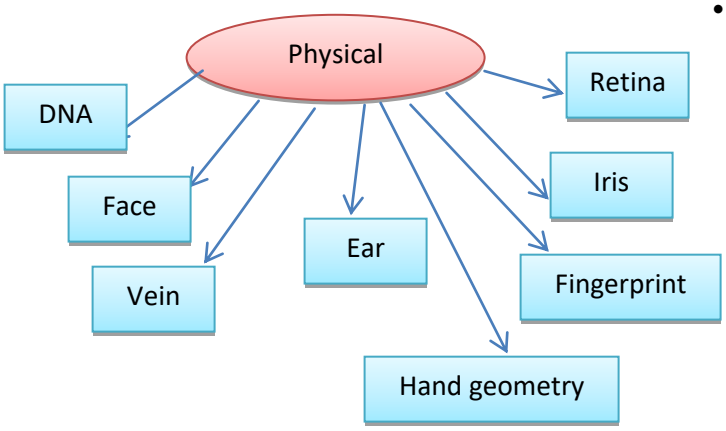
1) Safekeeping: like cards, keys, badges etc. but are easily stolen by thief or person can't bear them to whole time.
2) Acquaintance: like Password, PIN (personal identification number) sometimes this information forget by the person.
3) Biometric: In this no need to tolerate and no need to remember anything because it is related to the person's body. Like face, iris, fingerprint etc.

Biometric

Biometric plays an important role in crime investigation. It provides the highest accuracy as compared to other methods. Biometric used in many areas range from computer to critical area like nuclear power station [2, 3]. Biometric basically considered in 2 parts [4]:

A. Behavioral biometric: It is correlated to the pattern of person's behavior.
B. Physical biometric: It is associated to body parts.





Biometric mainly used for 2 purposes are as follows [5]:

1) Biometric Identification: in another words we can say recognition. In this only capturing of biometric is done
2) Biometric Authentication [6]: It also called verification of the person. Means of comparison is performed.

Parameter of biometrics

Biometric provides maximum exactness. By using this, person can be recognized easily. Biometric have a different parameters like [5]:

- Universal: Biometrics is found in every individual.
- Unique: Biometrics varies from person to person.
- Permanent: Characteristics can't be changed but some changes arrives as the person grows older.
- Capturable: Can easily be seized from anywhere.
- Performance: Speed and accuracy are taken into account.
- Acceptability: Can be operated in harmony with individuals thus keeps away conflicts.
- Convenient: It is easier to follow identification system.

Biometric Technologies

1) Face Recognition:

Photo snapshots can be captured with ease for farther distances too. Widely used for pick a person from bulk. It is a fast approach in crowded area to filter out the required face. This pathway involves identification & authentication of eyes, lips, eyebrows, nose, etc. to distinguish. Factors interrupting this mechanism includes change in facial expressions, effect of lightning, make over the face with cosmetics [7] etc. With the passage of time person grows and looks older and hence mismatch takes place.

2) Fingerprint:

From high degree of accuracy and precision point of view it is applied as primary biometric. Now a day it is used in many of the security purposes as mode of identification and authentication. As every individual has its own set of fingerprints and are unique. It is the foremost condition for the person to have in contact with fingerprint machine. However, gloves and chemicals can prevent the process of recognition. It demands high cost for system implementation [8].

3) DNA

Deoxyribonucleic acids are abbreviated as DNA. In every cell DNA are found as helical structured compounds and presence in every cell. These tests give 100 percent accurate results because it is unique for the every human. Identification is done with the segment from DNA. It requires the high cost for system establishment and process.

4) Iris

By this way effective result comes for the recognition. but it is necessary to brought iris equipment nearer to person's eye because it can't be captured from far distance. Cost also affects this technique [9].

5) Retina

It is the back portion of the eye which contains the bloody vessels layers. Wherever high security is needed this is considered mostly. Human need to stand in the front of the retina tracking machine till the scanning process is to be completed. Economic factor like Cost affects this method that's why isn't applied in broad spectrum.

6) EAR recognition:

It is small in size as compared to face so the completion time for processing is less then to face. Form long distance ear image can captured easily. With its complex structure it offers various feature points for comparison. Lots of advantage is that it does not vary with age and remain intact with emotional gesture. Remain unaffected by makeup, lighting effect, etc. [10-11]

7) Signature:

This is cheapest behavioral biometric. Widely used in various fields, at present used in banking areas for verify transaction. It provides the weak security because signature can be easily copied by another person and misuse. [12]

8) Hand and finger geometry :

This is famous biometric. Shapes of hand do not change with time .Geometry can be considered in 2 ways: (i) full hand considered then measurement are height and width of hand. (ii) When only fingers consider then measurements are shape of finger, length of finger, knuckles. 3D geometry commonly used for finger [13].

9) Voice recognition:

Generally, human talks then we examine the waveform patterns and air pressure .this process is done with speaker authentication and identification. It is worst biometric by means of voice mimicked by other person and when cold or throat problem occur then voice changed [14].

10) Keystroke Dynamics :

It can be calculated like as typing speed like as time taken to find the key and time taken to press key frequently. It is very sensitive because it change according to the time [15].

11) Odor:

It is related to olfactory biometric. Different person have different smell but it is not good because person uses the different type of perfumes and change them time to time.

12) Vein:

It is most important part of the human body, effective because then are always same and their structure is vary from person to person. For this special expansive devices required to capturing it. When movement of hand then vein patterns may be changed

13) Gait :

Different person has a different style of walking. Walking speed range may be very slow to running so difference show. The problem arises when people using different type of footwear, using of them their walking style also changed

Conclusion

Various biometric shown in this paper and comparison also shown. On the basis of comparison perfect technology select by the user. Economic factor also affect these technology so pick out the best suitable technology.

Biometrics	Performance with time	Comfort	Accuracy	Availability	Cost
Face	*****	**********	****	*******	*****
Fingerprint	******	******	******	*****	*******
DNA	**********	*	**********	**********	**********
Iris	*********	*********	**********	********	*********
Retina	********	********	*********	*******	********
Ear	*******	*******	******	*******	*****
Signature	****	***	****	******	****
Hand & finger geometry	******	*****	*****	******	******
Voice	**	***	**	****	**
Keystroke Dynamics	**	****	*	**	*
Odor	**	**	**	******	**
Vein	******	*****	*****	******	******
Gait	*	****	**	*****	**

Best Case Worst Case

Table 1: Comparative analysis of biometric techniques [16]

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