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Department of Computer Science, Parvathy's Arts and Science College, Dindigul, Tamilnadu, India

Biometrics Recognition Systems and Applications

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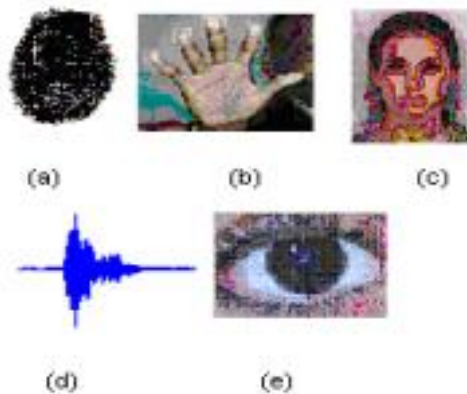
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ABSTRACT: The biometric system is used to secure our data in mobile or computer. The humans physical characteristics such that fingerprint, face, hand geometry, voice and iris. These will be give the authentication for the security systems. The existing security system has a lot of drawback to use .so that the main reason to use the security system .And this security system has the unique user ID and password for person identification. In this paper use can see the various biometrics and their application.

KEYWORDS: Survey biometric system, biometric various biometric features

I. INTRODUCTION

The biometric is used to identify the characteristics of a person. It is the physical as behavioural characteristics. The various biometric features like fingerprint, face, hand geometry, voice and iris [1]. In the existing system we can use the ID card, punch, secret password to authenticate the security system. But sometimes the password can be theft or stole places such that government office, companies and the personal use. It will be product our data [3]. The main advantages of the biometric system has the data accessed only by the user other person does not access it. If the password has forgotten. The biometric features used the unlock the system [4]. In this paper, we have discussed the various biometric features, the comparison of the biometric system and it's application.



II. BIOMETRICS

The various feature of biometric system has fingerprint, hand geometry, face, voice and iris. Every biometric has some merit and demerit. In that situation what is comfortable of the system and the security is based on the application in the system.

2.1 FACE

In the biometric recognition the face recognition is used very commonly. It will be based on the shape eye, nose, ear identification. In the face recognition there are some difficulties to find out. It will be based on the facial curves. In facial recognition automatically detect the facial biometric.

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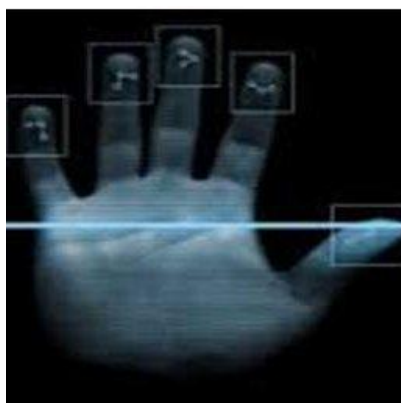
2.2 FINGERPRINT

The fingerprint biometric system is used commonly. It will be easy and comfortable to the user every user have various fingerprint biometric. So that the authentication is effectively. The fingerprint authentication is based on the password. It is the another way to access the data. In the current situation the fingerprint is used in the government id's mobile, computer, Companies security level.



2.3 HAND GEOMETRY

The hand geometry system are based the number of measurement size of fingers, palm. It is very easy and simple to use. It uses be in the whether changes like dry hard and other skin problem. This may not affect the growth of the period of children. If the hand geometry has scanned then the recognition will be accessed.



2.4 VOICE

Voice recognition has been currently used in various applications. It will be based on the voice, lips movement and the sound. Sometimes the voice may be changed due to cold, age, medical conditions. Then the voice recognition will be failure. It is the combination of physical biometrics.

2.5 IRIS

Iris is the unique structure of human and a biological feature. Also the left and right iris of some person is different. The iris recognition is more promising. The information will be collected by the iris and the information will be stored.

2.6 COMPARSION OF BIOMETRICS

The comparison of the various biometric methods is based on the various factors. The biometric features of fingerprint, face, hand geometry, voice and iris have the characteristics like universality, Uniqueness, performance and measurability. These characteristics are different for each biometric type. These can be measured in High, Medium and Low.



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TABLE 1
THE COMPARISONS OF BIOMETRIC CHARACTERISTICS.

Biometric Characteristic	Universality	Uniqueness	Performance	Measurability
Finger Print	M	H	H	M
Hand Geometry	M	M	M	H
Face	H	H	L	H
Iris	H	H	H	M
Voice	M	L	L	M

III. BIOMETRIC RECOGNITION SYSTEM

The biometric Recognition Systems are used to identify the person based on the feature vectors of any one of the biometric that the person possesses. These systems are person authorized systems hence offer more secure and convenient process of identification compared to alternative methods of identification. The computer based security systems are used in various commercial, civilian and forensic applications. A Simple biometric system consists of four modules: Image/Voice Acquisition, Preprocessing, Feature extraction and Recognition. The proposed system should be able to collect the biometric image or voice, to perform preprocessing on original input to encode, the input to encode the input to get feature vector to match the feature to recognize the person.

3.1 IMAGE/VOICE ACQUISITION MODULE

This is the first module to acquire the biometric input. The input can be image or voice according to the selection of biometric. The sensors like high resolution CCD camera or recorder can be used to capture the biometric image/voice.

3.2 PREPROCESSING MODULE

Once the input is captured the original input image or voice signal is processed to remove the noise and blurring effect. The image is localized to extract the region of interest.

3.3 FEATURE EXTRACTION MODULE

In the feature extraction module the preprocessed image /voice is used to extract the feature .The feature extraction algorithms are applied to get features vector of the biometric image/voice. There are various feature extraction techniques.

3.4 RECOGNITION MODULE

The feature vectors generated in the feature extraction module are used in this module to classify the biometric data. There are the classifiers like hamming distance, Euclidian distance, and support vector machine classifier.

IV. APPLICATION OF THE BIOMETRIC RECOGNITION SYSTEMS

The biometric is an emerging field of technology which uses the physical biological or behavioural characteristics that can be perform automatic recognition of a person. The biometric concentrates on physical aspects like fingerprint, hand geometry, face, voice and iris of a person.

4.1 FINGER PRINT

The fingerprint biometric system is easy to capture the data. This device used to secure entry devices for building door locks and computer network access. The fingerprint biometric system behaves the following features.



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1. Fairly small storage space is required for the biometric template reducing the size of the databases required.
2. It is one of the most developed biometric with more history research and design
3. Relatively inexpensive and offer very high levels of accuracy

4.2 HAND GEOMETRY

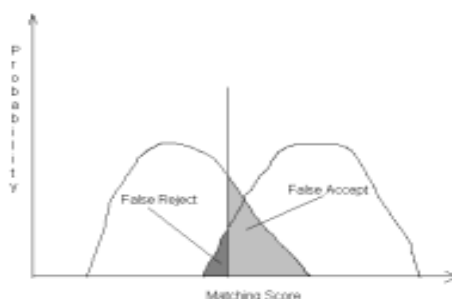
Hand geometry biometric recognition system uses the geometric shape of the hand to identify the person. This system also uses finger length, thickness, and curvature for the purpose of verification. The recent application of the hand geometry biometric system include the 1996 OLYMPICS games was controlled San Francisco International Airport uses hand geometry to restrict access to critical areas. The hand geometry is used in biometric systems as it behaves the following features.

1. Very small template size, easy to maintain and store large databases
2. High reliability and accuracy.
3. Relatively inexpensive offers excellent return on investment.

4.3 FACE

Face recognition biometric system uses facial characteristics of a person. It measures the overall facial structure, distances between eyes, nose, mouth, jaw edges. These features are extracted and used for identification of a person. Face recognition systems are using successfully in verification systems like document control of passport, drivers license transactional authentication, credit cards, ATMs, physical access accuracy time and attendance, entry and exit verification.

1. Facial photograph do not disclose information.
2. The facial image is already socially and culturally accepted internationally.
3. Many states have legacy database of facial images.



4.4 VOICE

The speech recognition is most important research area in the today's world. There are various speech recognition approaches. Among those are the acoustics phonetic pattern comparisons and automatic speech recognition approach.

4.5 IRIS

The iris image consists of the colored tissue surrounding the pupil. The iris recognition systems are known as real time, high confidence recognition of person identification. The iris recognition systems behave following features:

1. The most robust biometric technology available in the market today never had a false acceptance.
2. Biometric templates once captured do not need to be enrolled again iris stable throughout a the human life.

V. BIOMETRIC SYSTEM PERFORMANCE

The recognition accuracy is depending on the image acquisition, the position of acquiring sensor, intensity of light focusing, environmental changes, noise, and bad user's interaction with sensor. Therefore the two image acquired by the sensor may not be having same characteristics. The biometric matching systems are used to find the matching score between the two images. If the system decreases to make more tolerant to input variation and noise FAR increases. On the other hand if the system increases t to make the system more secure, FRR increases according.



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VI. CONCLUSION

The Biometric Recognition Systems are the automatic recognition systems which uses the physical characteristics of a person like fingerprint, hand geometry, face, voice, and iris. These systems overcomes the drawback of the traditional computers based security systems which are used at the places like ATM, passport, payroll, drivers licenses, credit cards, access control, smart cards, PIN, government offices and network security. Hence these systems are proved highly confidential computer based security systems.

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