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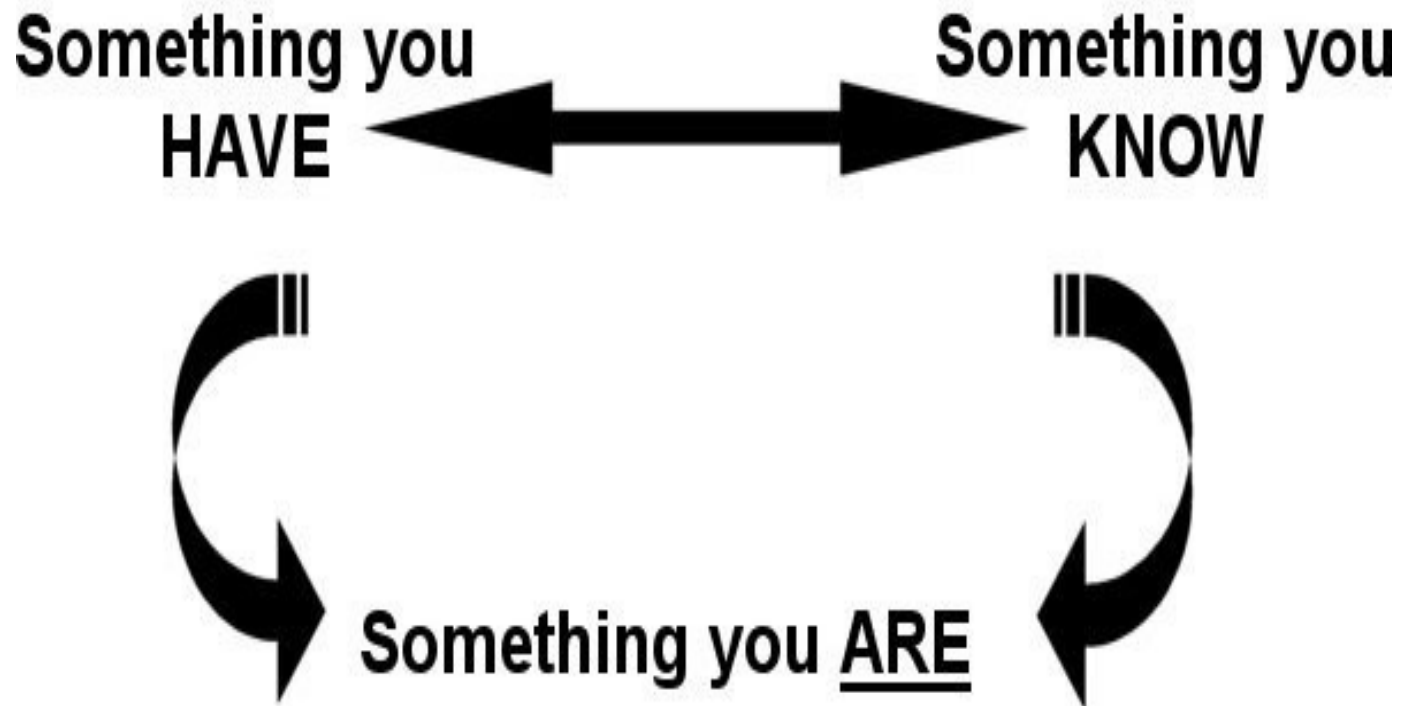
INTRODUCTION

WHAT IS BIOMETRICS ?

Biometrics refers to the automatic identification of a person based on his or her physiological or behavioral characteristics .

WHY BIOMETRICS ?

Level of Security



CHARACTERISTICS OF BIOMETRICS

❖ Any human characteristic can qualify as a biometric characteristic as long as it satisfies the following requirements:-

Universality *describes how commonly a biometric is found in each individual.*

Uniqueness *how well the biometric separates one individual from another.*

Permanence *measures how well a biometric resists aging.*

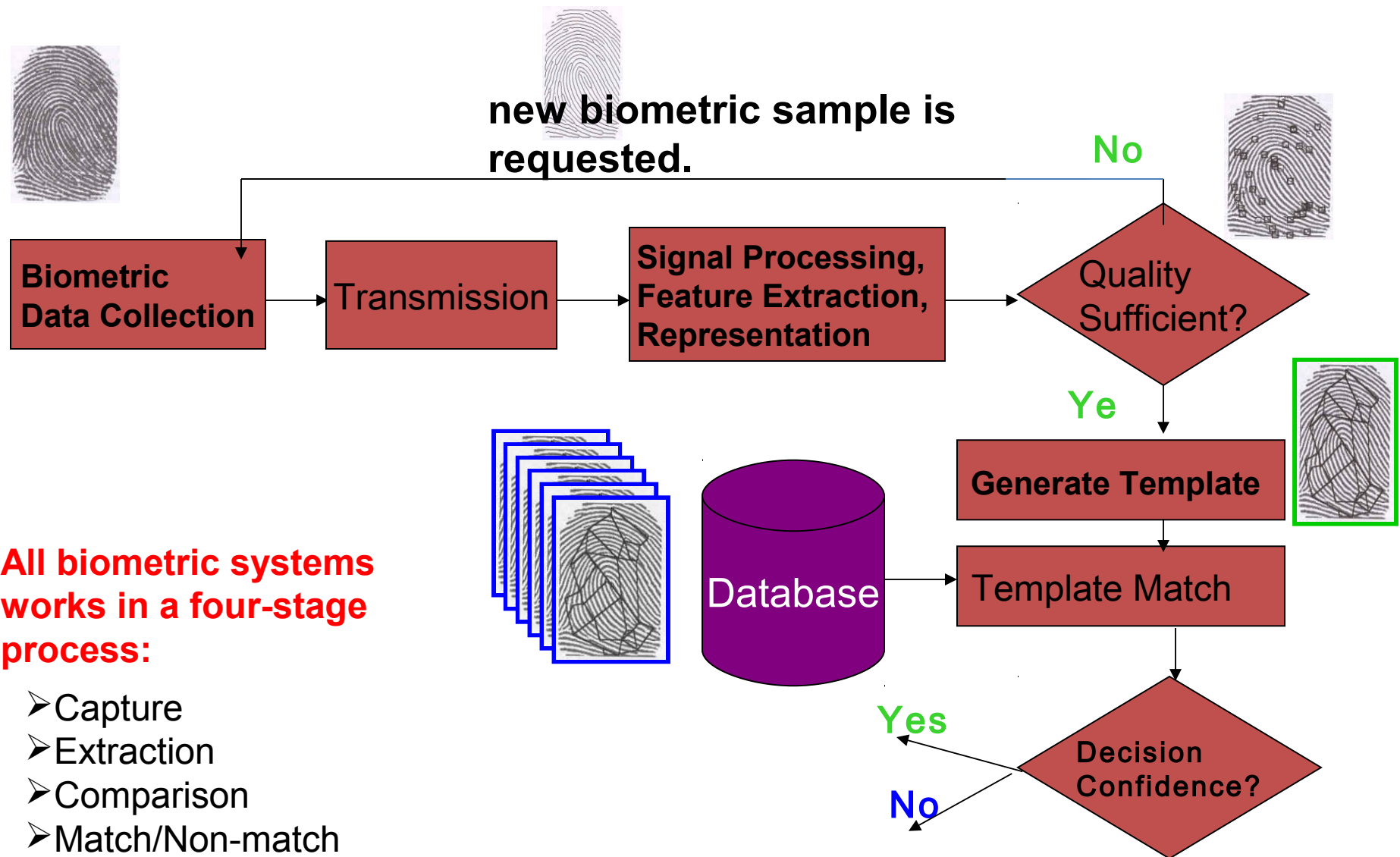
Collectability *explains how easy it is to acquire a biometric for measurement.*

Performance *indicates the accuracy, speed, and robustness of the system capturing the biometric.*

Acceptability *indicates the degree of approval of a technology by the public in everyday life.*

Circumvention *is how hard it is to fool the authentication system.*

HOW BIOMETRICS WORKS ?



A BIOMETRIC SYSTEM CAN OPERATE IN TWO MODES

- 1. Identification:** A one to many comparison of the captured biometric against a biometric database in attempt to identify an unknown individual.
- 2. Verification:** A one to one comparison of a captured biometric with a stored template to verify that the individual is who he claims to be.



March 27, 2015



TYPES OF BIOMETRICS

□ **Physiological**

- Face
- Fingerprint
- Hand geometry
- Retina
- Iris recognition

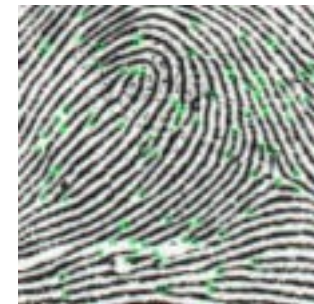
□ **Behavioral**

- Signature
- Voice



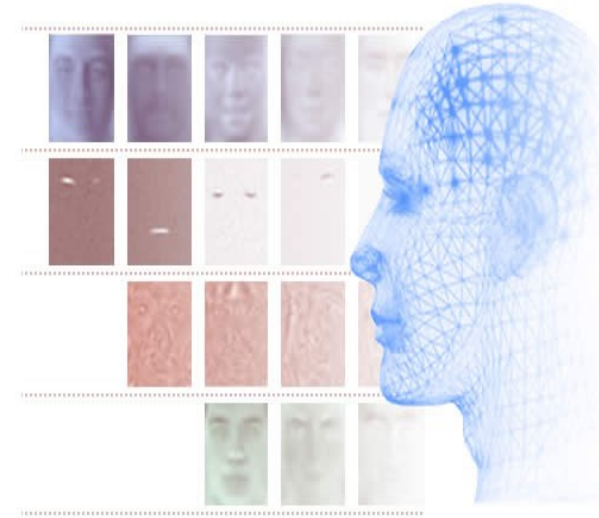
FINGERPRINT RECOGNITION

- A live acquisition of a person's fingerprint.
- Dots (very small ridges),
- Space between two divergent ridges,
- Spurs (a notch protruding from a ridge),
- Bridges (small ridges joining two longer adjacent ridges), crossovers (two ridges that cross each other).
- One of the largest fingerprint recognition system is **integrated automated fingerprint identification system**, maintained by FBI in the US since 1999.

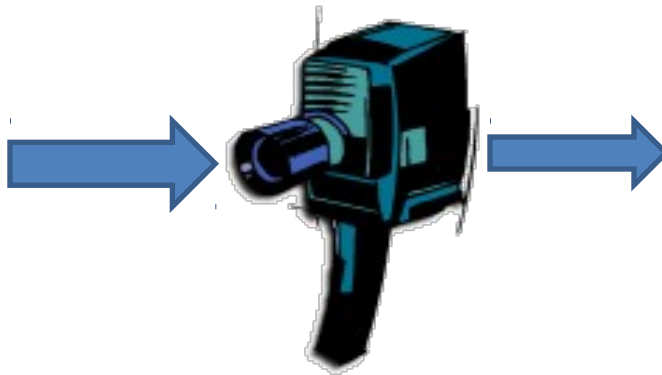
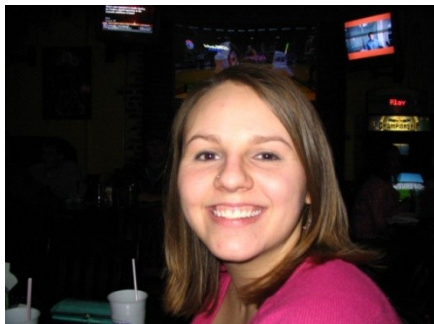


FACE RECOGNITION:

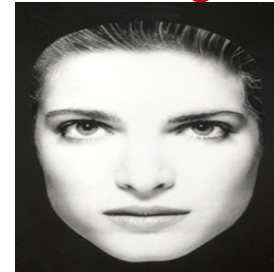
- Face recognition uses the visible physical structure of the face and analyses the spatial geometry of distinguishing features in it to identify an individual.



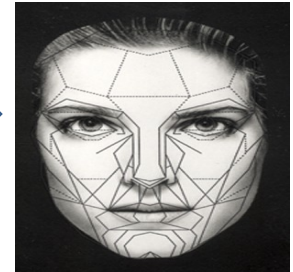
Input face image



Extraction of face image

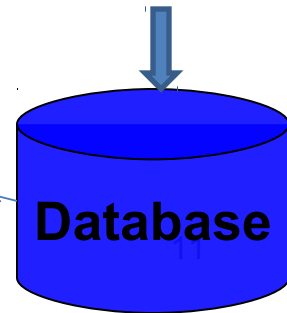


Extraction of face features



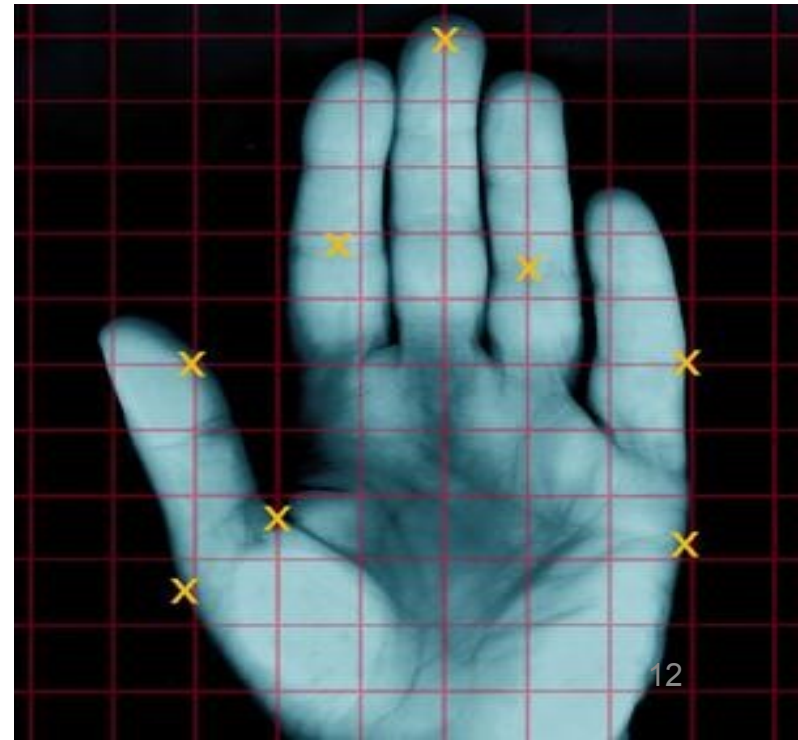
Positive

Negative

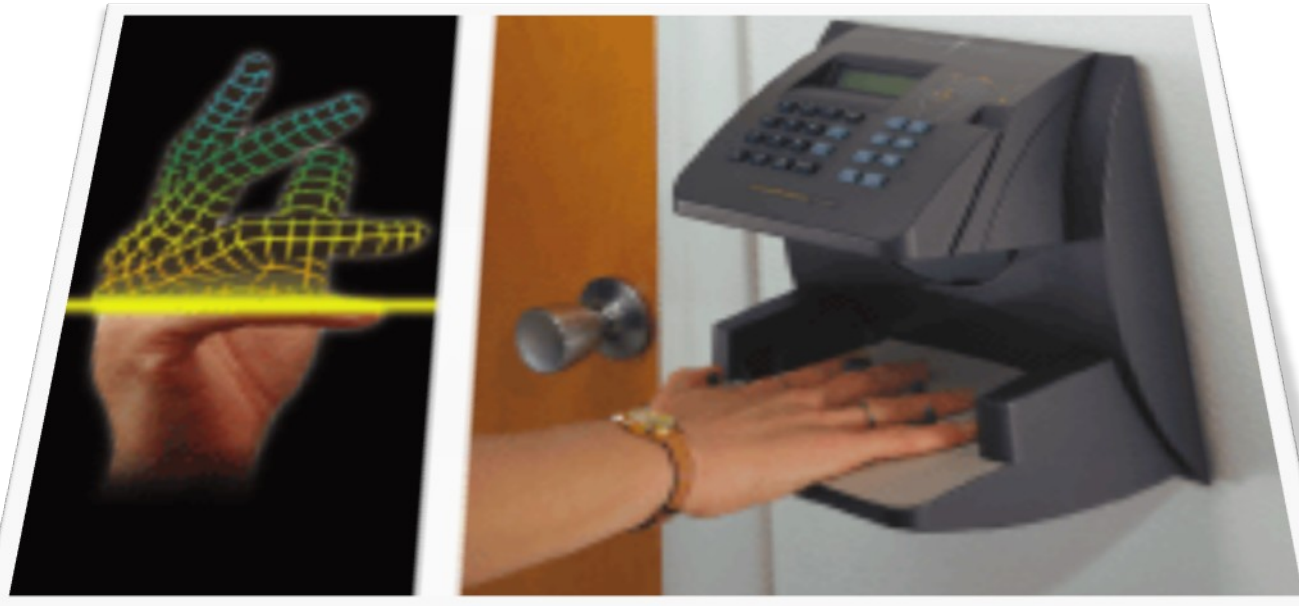


HAND GEOMETRY

Hand or finger geometry is an automated measurement of many dimensions of the hand and fingers.

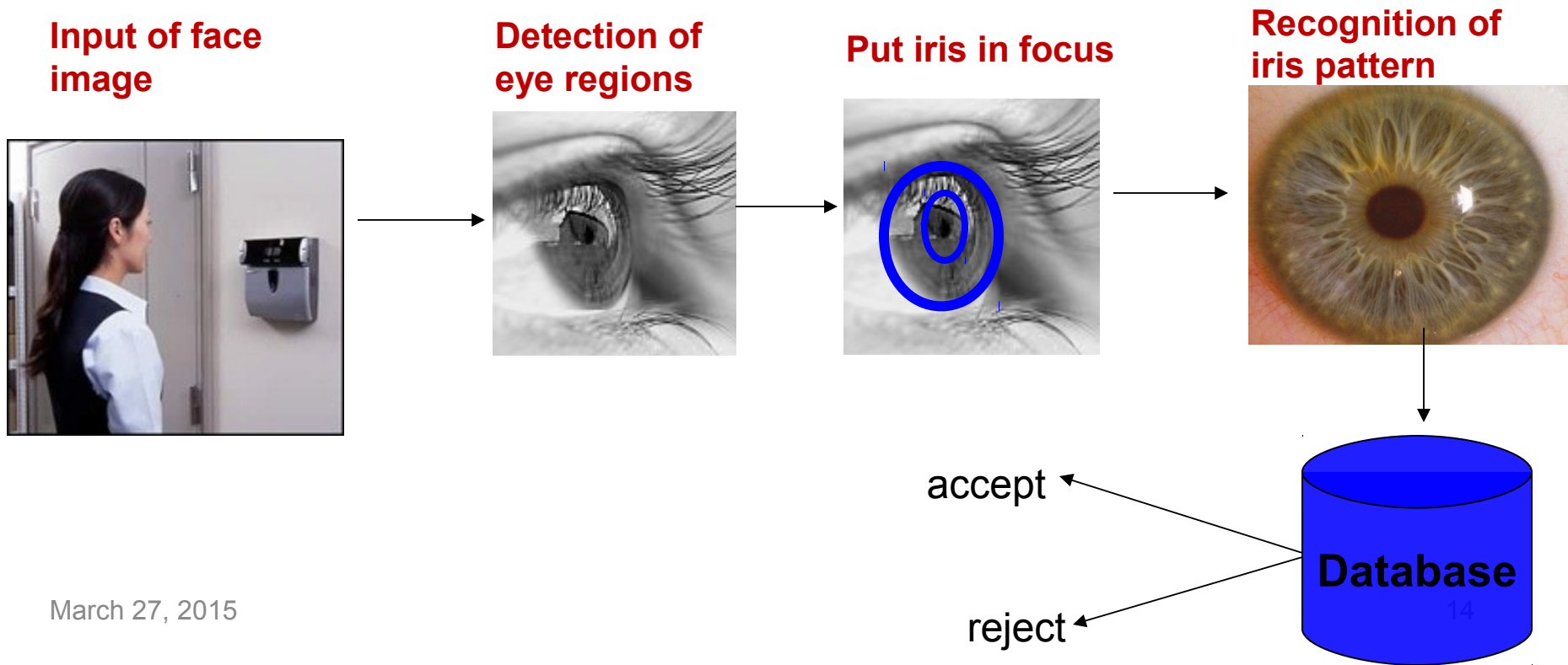


- Based on a number of measurements taken from the human hand.
- The technique is very simple, relatively easy to use, and inexpensive.
- The physical size of a hand geometry-based system is large.



IRIS RECOGNITION

- Iris scanning measures the **iris pattern** in the colored part of the eye.
- Iris recognition **uses camera technology** with subtle infrared illumination to acquire images of the detail-rich, intricate structures of the iris.



RETINA RECOGNITION

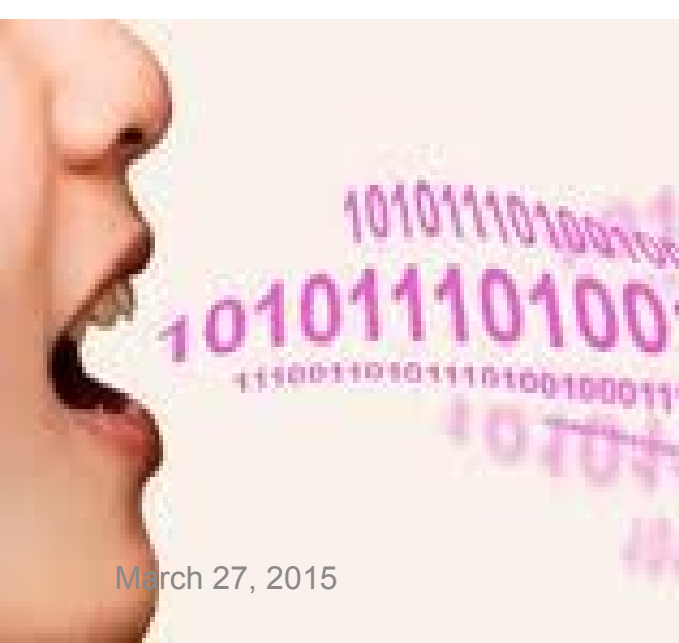


- It analyzing the **layer of blood vessels** situated at the back of the eye.
- The machine takes around ten seconds to shine a “**low intensity coherent light source**” onto the retina to illuminate the blood vessels.
- Once the machine has a copy of the **scan**, it **compares** the picture to all the different scans on file, looks for a **match**, and **identifies** the individual.
- Retina scan machines are **fairly expensive**.

SPEAKER / VOICE RECOGNITION

Voice or speaker recognition uses vocal characteristics to identify individuals using a pass-phrase.

A telephone or microphone can serve as a sensor,



SIGNATURE VERIFICATION

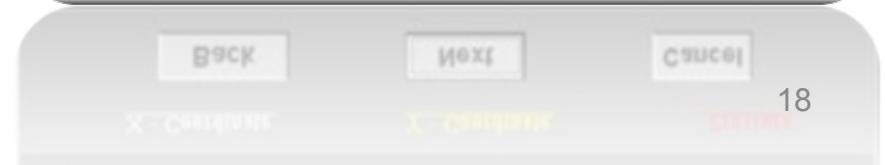
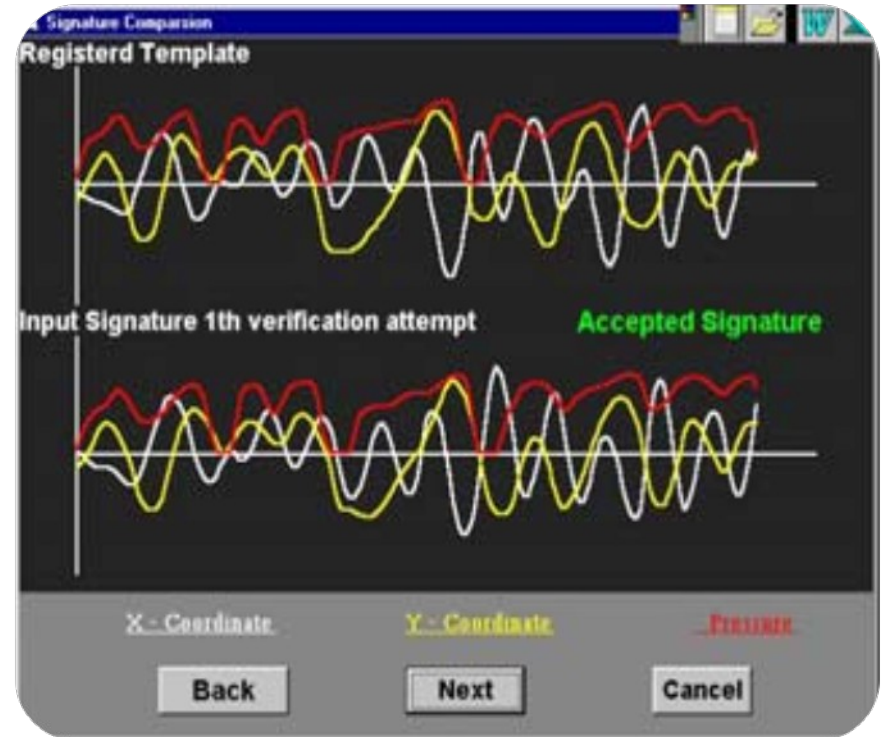
❑ **Signature identification:** is the analyses of the way a user signs his or her name.

❑ **This technology examines :**

- speed.
- direction .
- pressure of writing.
- the angle at which the pen is held.
- the number of times the pen is lifted.
- the time it takes to write the entire signature.



❑ **The process used by a biometric system to verify a signature is called **dynamic signature verification (DSV)**.**



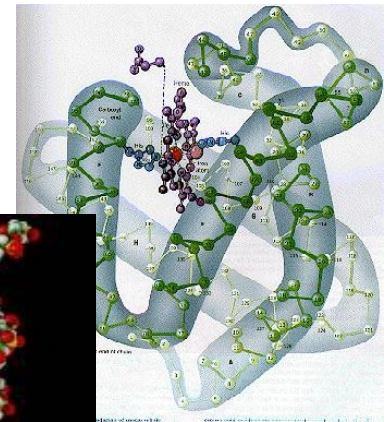
COMPARISON OF BIOMETRICS TECHNOLOGY

Biometrics	Universality	Uniqueness	Permanence	Collectability	Performance	Acceptability	Circumvention
Face	high	low	medium	high	low	high	low
Fingerprint	medium	high	high	medium	high	medium	high
Hand Geometry	medium	medium	medium	high	medium	medium	medium
Iris	high	high	high	medium	high	low	high
Retinal Scan	high	high	medium	low	high	low	high
Signature	low	low	low	high	low	high	low
Voice Print	medium	low	low	medium	low	high	low
F.Thermogram	high	high	low	high	medium	high	high

FUTURE PROSPECTS

Biometry is one of the most promising and life-altering technologies in existence today. It is all set to change the way we live in the future. Some of the emerging biometrics technologies in the near future are:

1. Ear shape identification.
2. Body odor identification.
3. Body salinity identification.
4. EEG Fingerprint
5. DNA matching



APPLICATIONS

- Prevent unauthorized access to ATMs, Cellular phones
Desktop PCs
- Criminal identification
- In automobiles biometrics can replace keys with keyless entry devices
- Airport security

ADVANTAGES OF BIOMETRICS

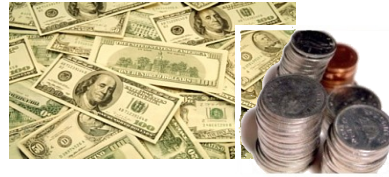
- Increase security.
- Eliminate problems caused by lost IDs or forgotten passwords.
- Reduce password administration costs.
- Make it possible, automatically, to know WHO did WHAT, WHERE and WHEN?
- Replace hard-to-remember passwords which may be shared or observed.

MULTIMODAL BIOMETRICS SYSTEM

- It utilize more than one physiological or behavioral characteristic for enrollment, verification or identification.
- This system takes advantage of the capabilities of each individual biometric.
- It can be used to overcome some of the limitations of a single biometrics.

DISADVANTAGES OF BIOMETRICS

1. costly.



2. Facial imaging can also hinder accurate identification.



3. The scanning of eye is fearful.



4. Missing body part problem.



5. False acceptances and rejections.



6. The nervousness that people feel about biometric scanners identification.



CONCLUSION

- Biometric is an emerging area with many opportunities for growth.
- Decreasing costs and increasing convenience.
- Increasing both privacy and identity security.
- Possibly in the near future, you will not have to remember PINs and passwords and keys in your bags or pockets will be things of the past.