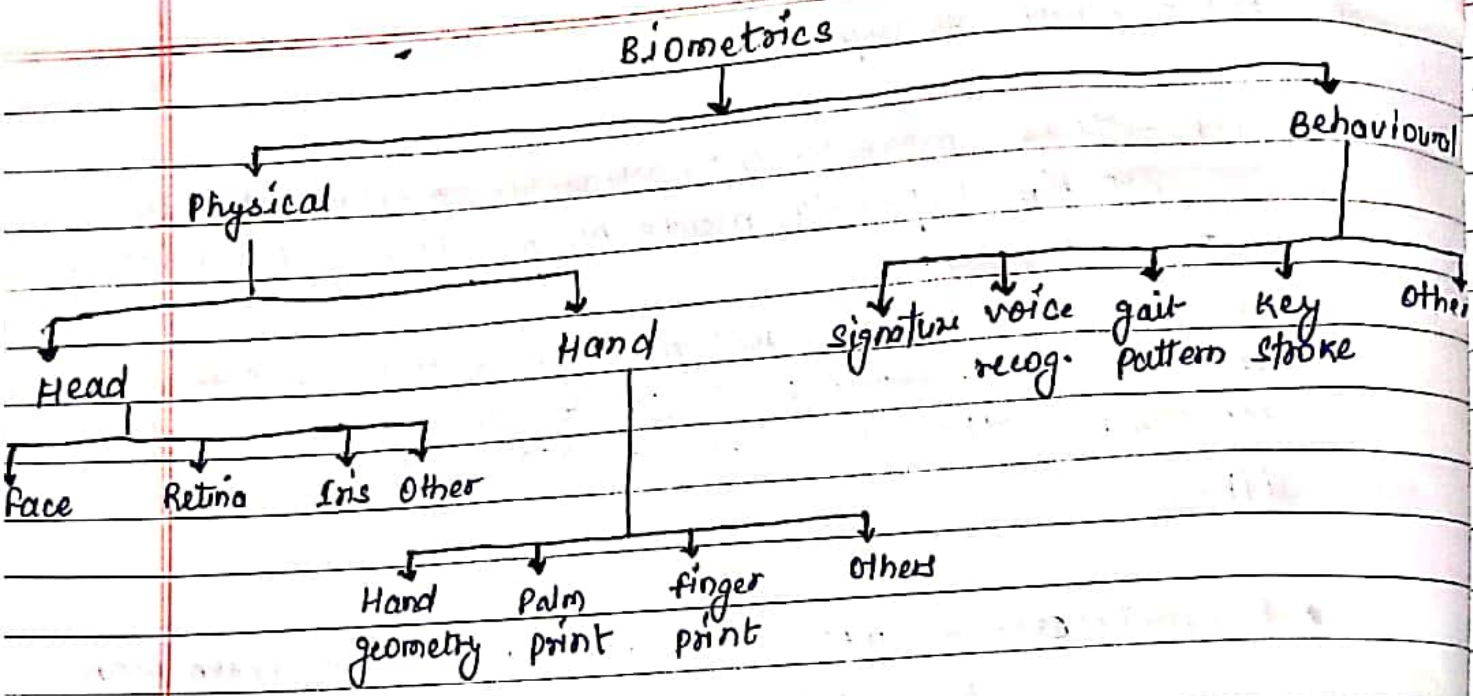
- Biometrics:- Biometrics is the term derived from Greek word "Biometron": Bio means life and metron means to measure.

2. It is a defined as a tool for the identification and verification of the person on the basis of physiological and behavioral characteristics of the person.

- Physiological characteristics:- fingerprint
2. Hand geometry
3. Facial Recognination
4. Iris
5. Retina
6. Vein pattern
7. Skin spectroscopy
8. DNA

- Behavioural characteristics:- Gate pattern Analysis
2. Keystroke Analysis
3. Dynamic Signature Analysis
4. Voice Recognination.



Mode of biometric system :-

- Identification :- One to many comperison.

2. It search for a sample against a data base of templates.
3. It identifies an known individual.

Verification :- 1 to 1 comparison.

2. It compares a sample against a single stored templete.
3. It verifys that the individual is who he claim to be.

- Working of Biometric system :-

1. Capturing
2. Pre processing
3. Feature extraction.
4. Templete matching
5. Comparison
6. Application device.

- Biometric device consist of :-

1. A scanning device.

2. A software which converts scanned information into digital form and compares on some matching points.
3. A data base that stores biometric features for further comparison.

- Biometric Techniques:-

. Fingerpoint :- It is the oldest and most widely used method.
2. It needs a fingerpoint reader.
3. Registered points are located and compare.
4. optical sensors are used for scanning purpose.
5. It can be used for many applications like attendence system etc
6. Uses the ridge endings and delta or other identification points considered for matching.
7. The number and locations of the minute vary from finger to finger in any particular person and from person - person for any particular finger.

- Face Recognation :- It is a biometric technique for automat-ic identification or verification of a person from a digital image.
2. These include the position / size / shape of the eyes, nose cheek holes and jaw lines.

- Iris Recognination :- It measures the iris pattern of the eye. (It is the coloured part of the eye that surround pupil).
2. The iris scanner analysis the features like ring, furrows and colour tissue surrounding people.
3. Iris pattern is not changed.

Hand Geometry :- This method uses hand image for person's identification or verification.

2. In this method image of hands captured & to extract no. of features such as finger length, breadth, thickness, finger area, etc.
3. Measures the digit of the hand and compares to those collected at the time of enrollment.
4. Place hand on a system, which takes 3-D image of the hand.

- Voice Recognination/ speaker Identification :- It is a biometric process of validating a user's claimed identity using characteristics extracted from their voice.

2. It uses the pitch, pattern, tone, frequency, rhythm of speech for identification purpose.
3. A telephone or microphone can act as sensor.
4. During the enrollment phase the spoken words are converted from analog to digital format and the distinctive vocal characteristics such as pitch, frequency and tone are extracted and spoker model is established.
5. A templete is then generated and stored for future comparison
6. It is often used when voice is only available biometric identifier such as telephone.

- Performance Matrix :-
  - FAR :- False Acceptense Rate.

It is major of the present of invalid inputs that are incorrectly accepted.

- FRR :- False Reject Rate

It is measure of the present of valid inputs that are incorrectly Rejected.

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- CER :-(Crossover Error Rate) The rate at which both the accept and reject error are equal.

2. A lower value of CER is more accurate for biometric system.

- Application of Bio metric system
1. Criminal Identification
2. Net Banking
3. Attendence System
4. Airport
5. Bank security
6. PC login security
7. Prevents unauthorised Access to private data.

- Limitation of Biometric system:-
1. Variations in enrolled data.
2. Non universality.
3. It is an expensive security solution.