



**Centurion**  

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**UNIVERSITY**

Topic:-Speaker  
recognition and its  
applications.

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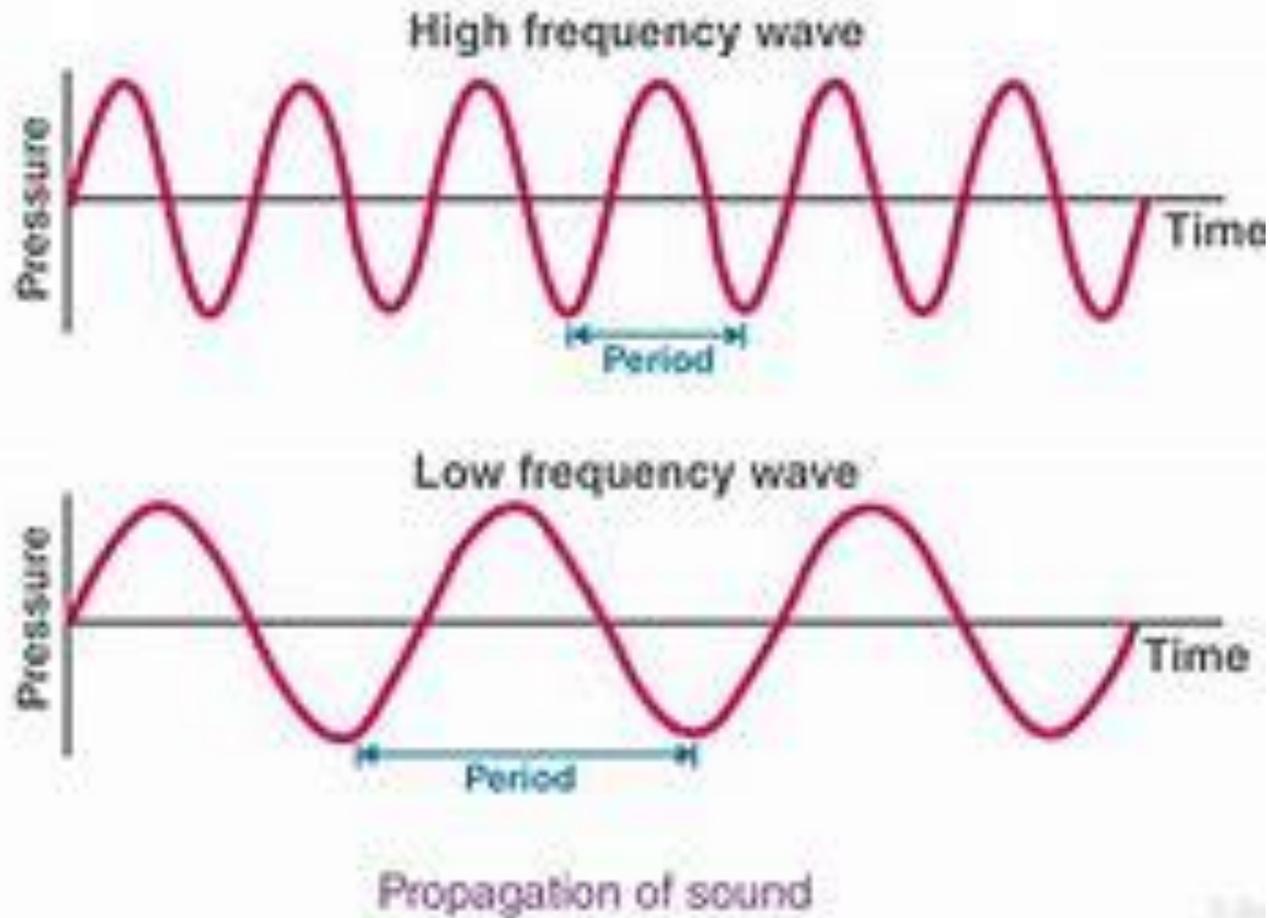
# CONTINUE.....

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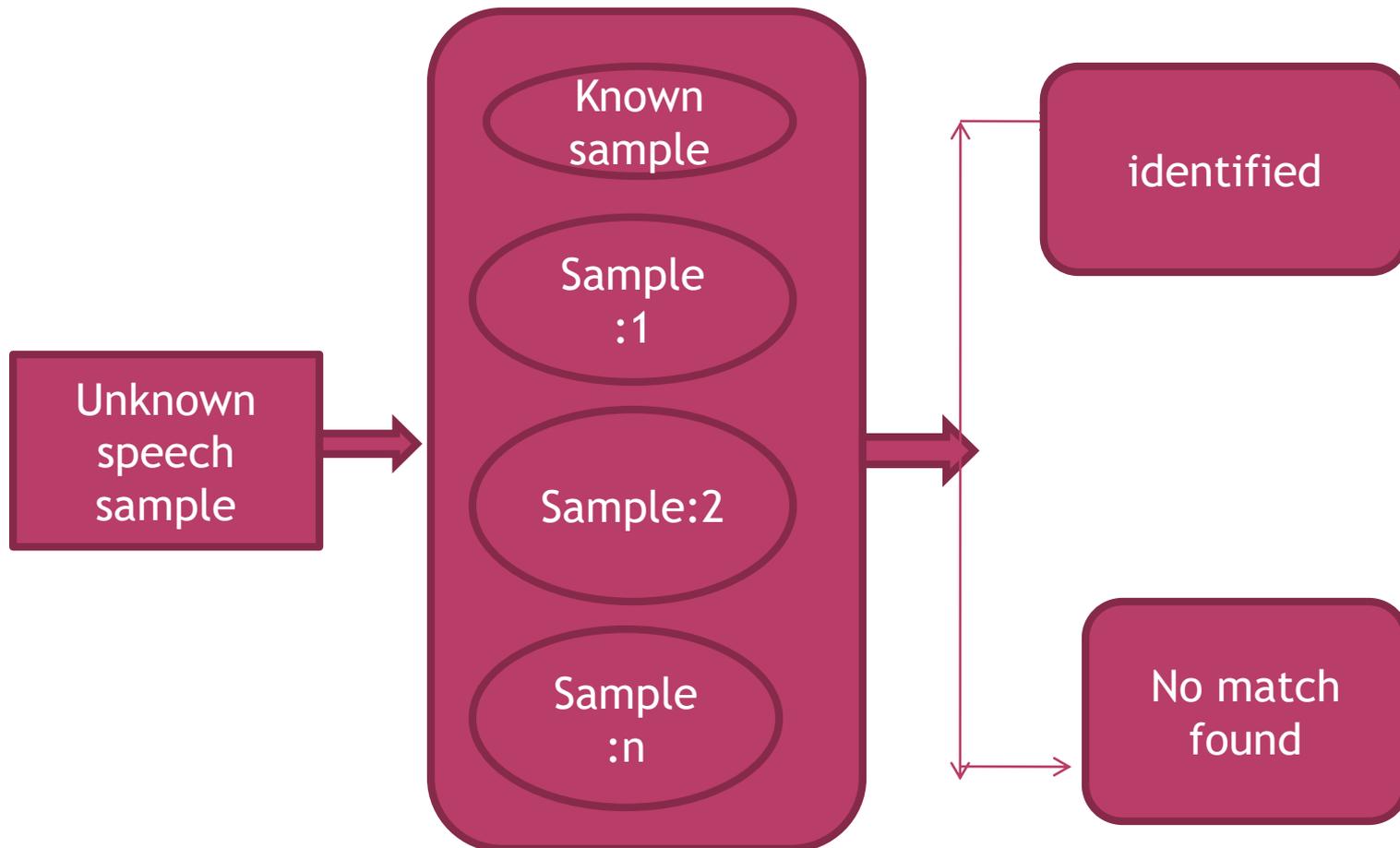
# INTRODUCTION:-

- ⦿ This process contains all those activities which attempt to link a speech sample to its speaker through its acoustic or perceptual properties.
- ⦿ The process of speaker recognition has two broad application areas:
  - 1: speaker identification.
  - 2: speaker verification.
- ⦿ There are two modes of operation related to known voices:-
  - 1: closed set
  - 2: open set

# PROPAGATION OF SOUND WAVE:-

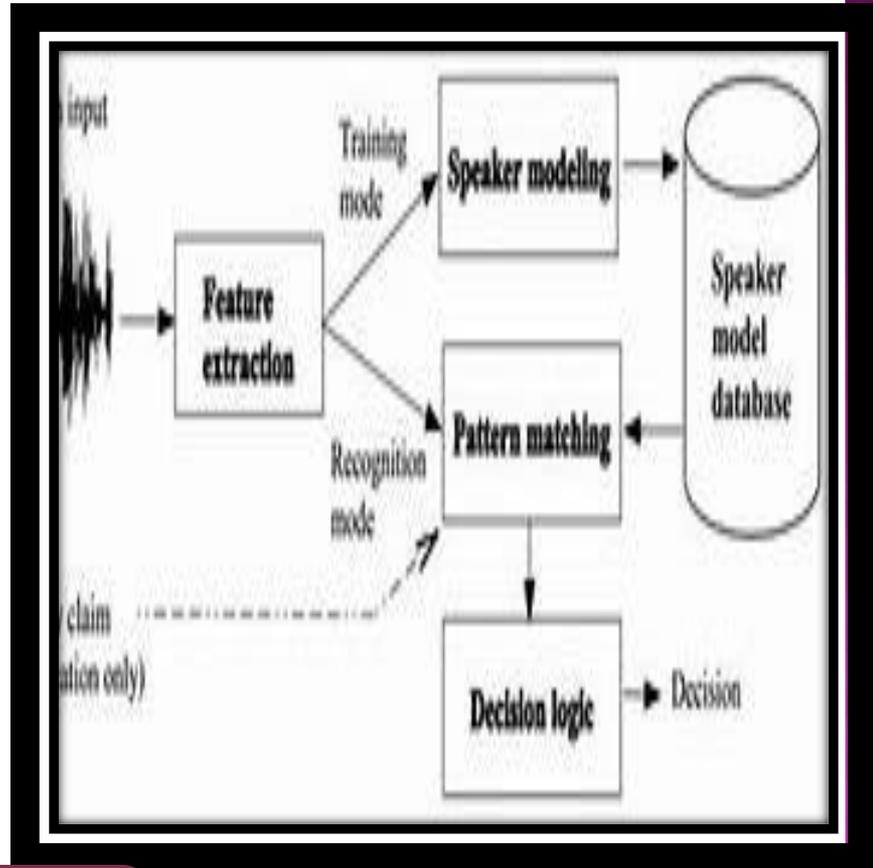
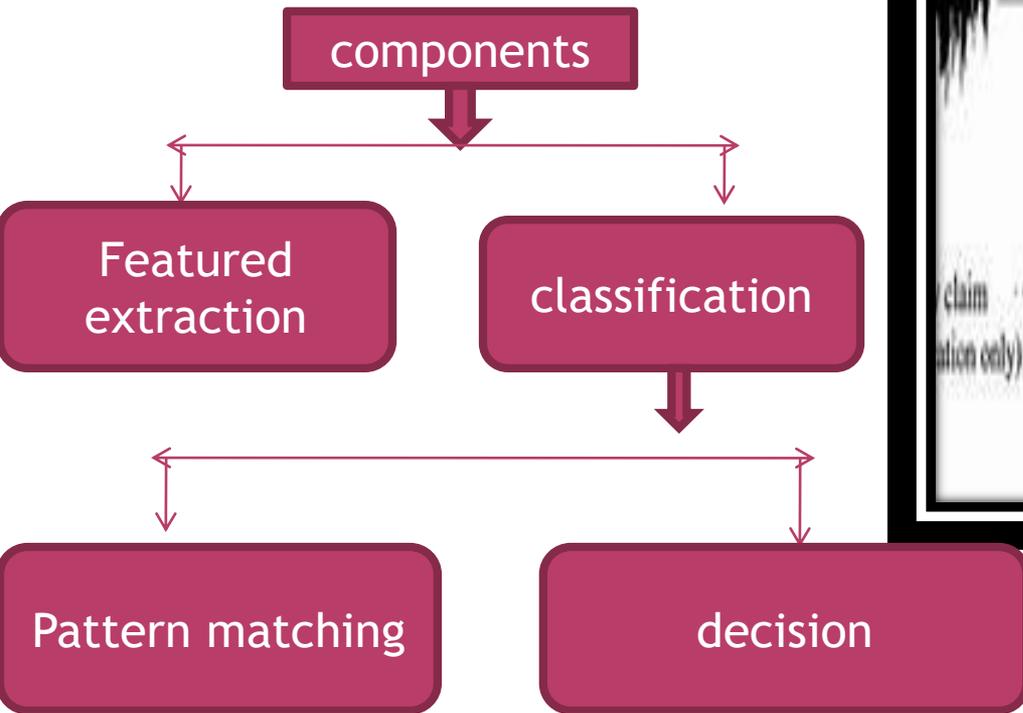


# SCHEMATIC REPRESENTATION OF SPEAKER IDENTIFICATION:-



# COMPONENTS OF SPEAKER RECOGNITION:-

The main components of speaker recognition system are featured extraction and classification.



# 1:FEATURE EXTRACTION:-

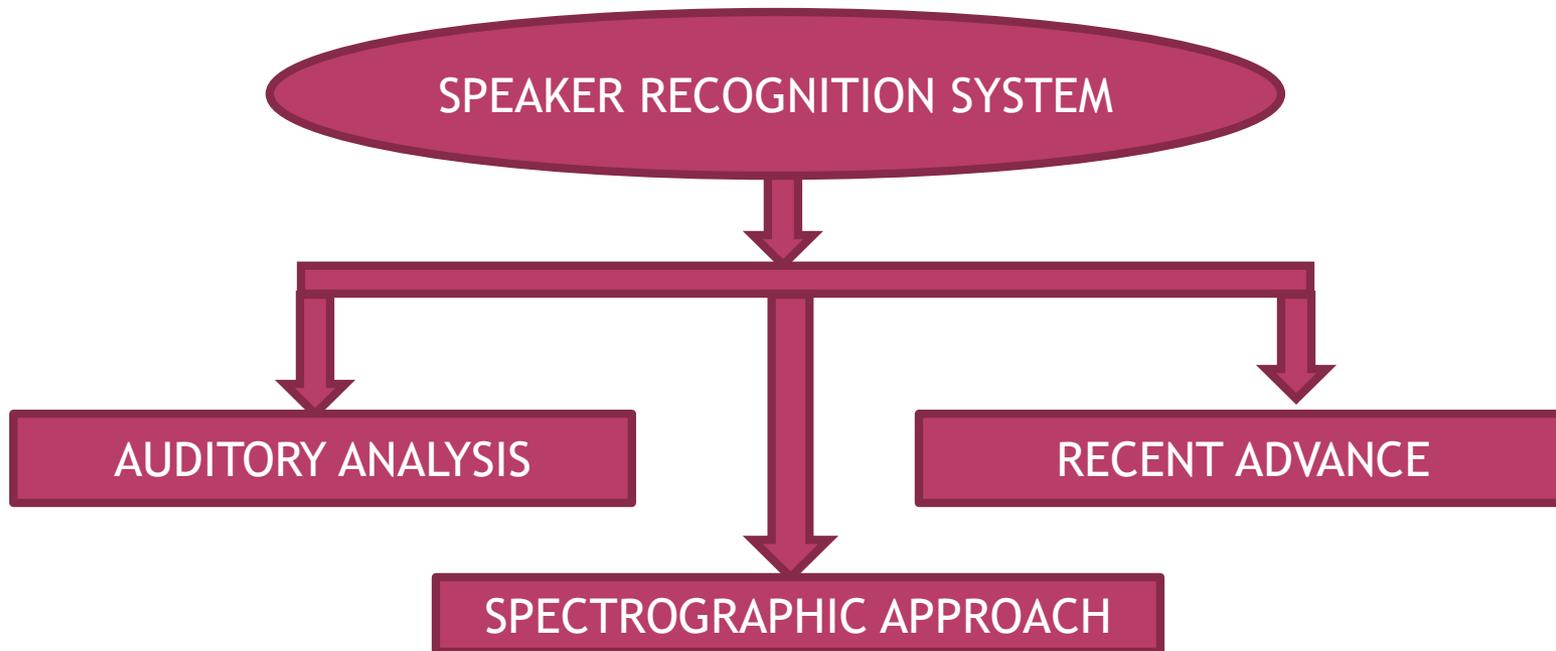
- ⦿ This is the first step in the process of speaker recognition.
- ⦿ Criteria of featured selection:-
  - 1:Have low intraspeaker variability and high interspeaker variability.
  - 2:Occurs frequently and naturally in speech.
  - 3:Difficult to mimic.
  - 4:Not be affected by speaker's health or long term variations in voice.

# PATTERN MATCHING & DECISION:-

- ◎ The pattern matching deals with the comparison between the estimated features to the speaker models.
- ◎ Some of the pattern matching methods used in speaker recognition includes Hidden markov models(HMM),Dynamic time warping (DTW),Neural network and vector quantization(VQ).
- ◎ The evaluation of these scores is done using decision module and the result are accordingly presented.

## VARIOUS APPROCHES TO SPEAKER RECOGNITION SYSTEM

- ◉ In the discipline of speaker recognition a wide range of methods and procedures are adopted by the experts for identification.



# 1:AUDITORY ANALYSIS:-

- ◉ It is a proposed model for the basis of auditory perception.
- ◉ This is understood as the process by which the human auditory system organizes sound into perceptually meaningful elements.

## Auditory analysis deficits

- Pure word deafness.
- Impaired speech perception in the context of good speech production.
- Hempel & Stengel (1940).
- 34 year old.
- Fell from a bus.
- First thought to be deaf.
- BUT audiometric testing normal.

## 2:SPECTROGRAPHIC APPROACH

- ◎ This involves the semi automatic measurements of particular speech parameters such as vowel formants, articulation rate, which is sometimes combined with the result of auditory phonetic analysis by human expert
- ◎ A sound spectrograph is an instrument which is able to give a permanent record changing energy frequency distribution throughout the time of a speech wave.

### 3:RECENT ADVANCE:-

- ⦿ This method differs from the earlier methods used for identification as it is both universal as well a automatic.
- ⦿ It is considered universal because it doesnot focus on specific acoustic parameters and considers the speech as a continuously varying complex wave or signal.
- ⦿ While,it's automatic nature reduces the subjective evaluation of any speech material to minimum.

## EXPRESSING RESULT IN FORENSIC SPEAKER RECOGNITION:-

○ Like in other disciplines in the forensic field, a voice expert generally renders his or her opinion in terms of probability of evidence under two rival assumptions

1=Prosecution hypothesis : the unknown or the test sample is originated from the given source.

2=Defence hypothesis : the unknown or the test sample is originated from some other members of potential suspect population, like the adult male population of a town or a particular region.

# SIGNIFICANCE....

## ◎ Security or access control:-

The voice of a person can be successfully used as a biometric feature as it is well accepted by the users and can be easily recorded using microphones and hardware of low costs.

## ◎ Law enforcement:-

voice of a person can plays a vital role in forensic examination. In the present era , widely available facilities of telephones , mobiles and tape recorders results in the misuse of the device and thus making them an efficient tool in commission of criminal offences such as kidnapping , extortion , blackmail threats e.t.c.



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*dreamstime*