

# Processing & Analysis of Speech

The slide features a white background with the title 'Processing & Analysis of Speech' in a blue sans-serif font. At the bottom, there are decorative blue elements: a horizontal bar on the left with a wavy, layered effect, and a large, solid blue shape on the right that resembles a stylized wave or a speech bubble tail.

# Processing & Analysis of Speech

- **Processing of Speech**

- ✓ Acquisition of speech signal
- ✓ Digitization of speech
- ✓ Concept of LTI system & It's response
- ✓ Convolution & Correlation
- ✓ Frequency-Domain representation of speech
  - DFT Relations & Graphical Interpretation
- ✓ Various representations of system
  - Poles & Zeros of the system

- **Analysis of Speech**

- ✓ Time-Domain Analysis
- ✓ Frequency-Domain Analysis
- ✓ Liner Predictive Coding Analysis
- ✓ Cepstral Analysis
- ✓ Sinusoidal Analysis
- ✓ HNM Analysis
- ✓ Group-Delay Analysis

# Processing of Speech

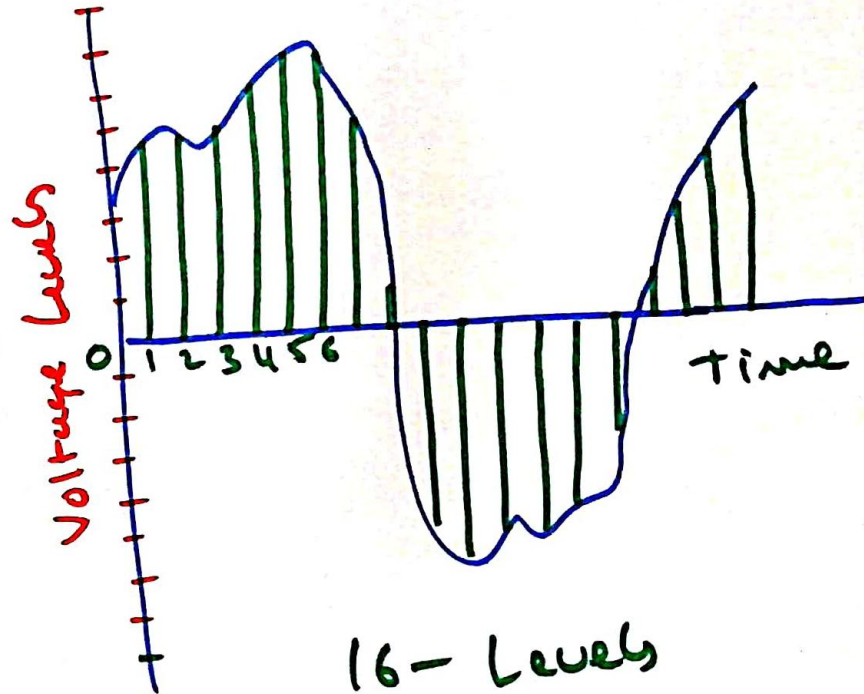
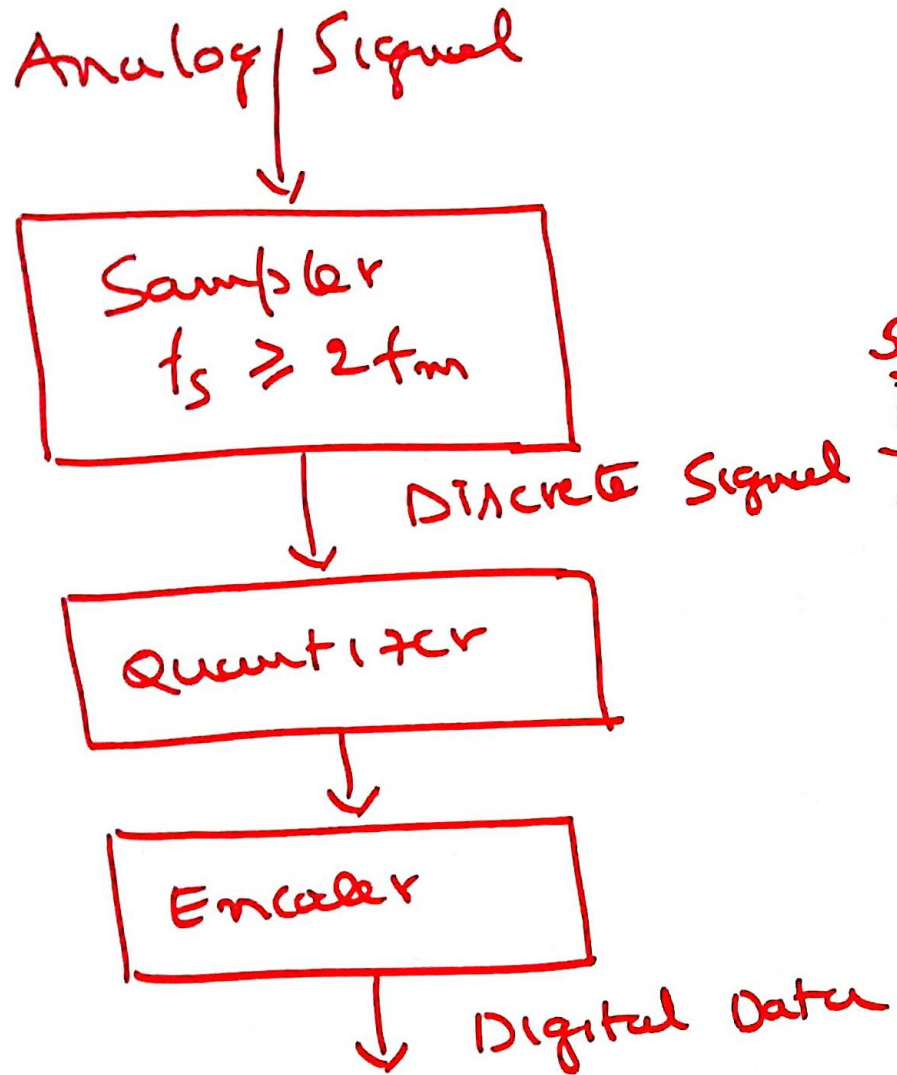


# Acquisition of Speech



Acoustic Pressure Variations  
↓  
Voltage / Current Variations (Analogy)

# Digitization of Speech

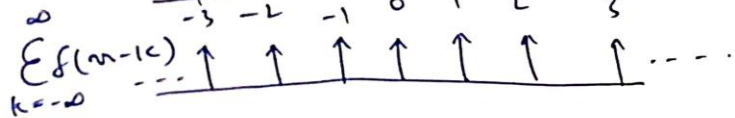
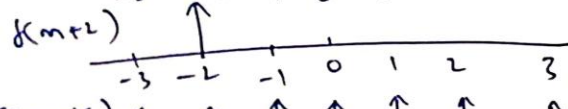
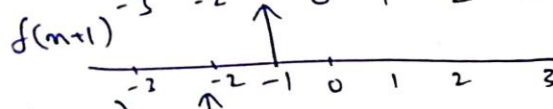
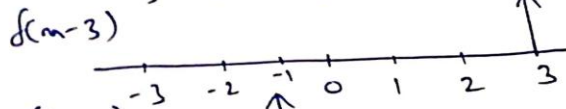
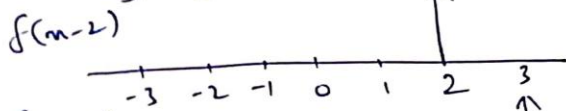
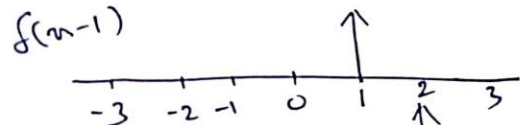
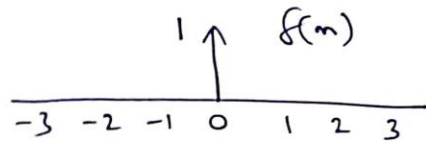


# Unit Sample & Representation of Discrete Signal

Unit Sample

$$\delta(n) = 1 \quad n=0$$

$$= 0 \quad n \neq 0$$



Unit Sample Sequence =  $\sum_{k=-\infty}^{\infty} \delta(n-k)$

Discrete Time Signal  $x(n) = \sum_{k=-\infty}^{\infty} x(k) \delta(n-k)$



$x(0) \delta(n)$

$x(1) \delta(n-1)$

$x(2) \delta(n-2)$

$x(3) \delta(n-3)$

$x(-1) \delta(n+1)$

$$\sum_{k=-\infty}^{\infty} x(k) \delta(n-k)$$

$x(n)$

$\Downarrow$