SIGNALS AND SYSTEMS

Working with simple Sensors and DT signals

Introduction to Sensors and DT Signals

- Sensors
- Discrete-Time (DT) Signals
- Importance

Types of Simple Sensors

- Temperature Sensors (e.g., Thermocouples)
- Pressure Sensors (e.g., Barometers)
- Light Sensors (e.g., Photodiodes)
- Proximity Sensors (e.g., IR Sensors)
- Each sensor type converts physical quantities into electrical signals.

Sampling and Discretization

- Sampling
- Sampling Rate
- Aliasing

Analog-to-Digital Conversion (ADC)

- ADC
- Quantization
- Resolution

Working with Sensor Data in Discrete-Time

Processing Steps:

- Filter raw data to reduce noise.
- Downsample if necessary.
- Apply transformations or features for analysis.

Use Cases:

- Temperature monitoring, motion detection, etc.

Filtering and Noise Reduction

- Noise
- Types of Filters
  - Low-pass filter
  - Moving average filter
- Importance

Applications in Real-World Scenarios

- Temperature Control Systems
- Home Automation
- Medical Devices

Thank you