E2MATRIX

Training and Research Institute

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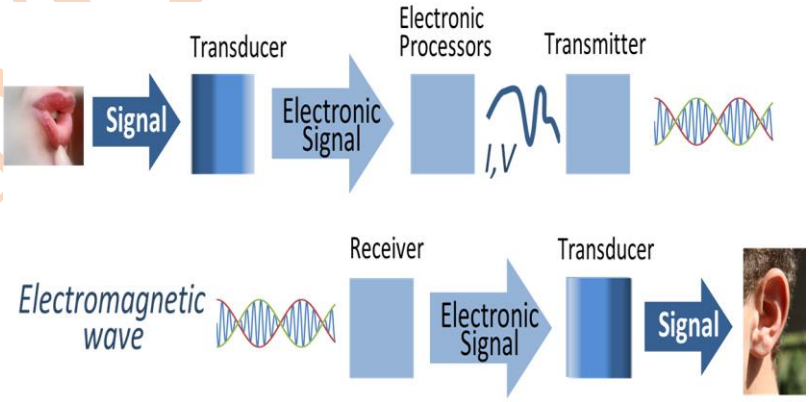
SIGNALS IN MATLAB COURSE STRUCTURE

Signal processing is an enabling technology that encompasses the fundamental theory, applications, algorithms, and implementations of processing or transferring information contained in many different physical, symbolic, or abstract formats broadly designated as signals. It uses mathematical, statistical, computational, heuristic, and linguistic representations, formalisms, and techniques for representation, modelling, analysis, synthesis, discovery, recovery, sensing, acquisition, extraction, learning, security, or forensics

Digital signal processing is the processing of digitized discrete-time sampled signals. Processing is done by general-purpose computers or by digital circuits such as ASICs, field-programmable gate arrays or specialized digital signal processors (DSP chips). Typical arithmetical operations include fixed-point and floating-point, real-valued and complex-valued, multiplication and addition. Other typical operations supported by the hardware are circular buffers and look-up tables. Examples of algorithms are the Fast Fourier transform (FFT), finite impulse response (FIR) filter, Infinite impulse response (IIR) filter, and adaptive filters such as the Wiener and Kalman filters.



Module 1 Creating and importing signals

1. Sampling and resampling
2. Visualizing signals
3. Modeling noise
4. Signal statistics and correlation

Module 2 SPECTRAL ANALYSIS

1. Discrete Fourier transform
2. Windowing and zero padding
3. Power spectral density estimation
4. Spectrum objects
5. Time-varying spectral

Module 3 LTI SYSTEM

1. LTI system representations
2. z-transform
3. Frequency and impulse response
4. Introduction to filtering

Module 4 FILTER DESIGN

1. FIR Filter
2. IIR Filter
3. Median Filter
4. Adaptive Filter
5. Multirate Filter

Module 5 FILTER IMPLIMENTATION AND PRACTICAL APPLICATIONS

1. Filter architectures
2. Filter realization
3. Filter quantization
4. Frequency Representation of Signal
5. Signals Encoding and Decoding
6. DB Calculation of Real Time Signal