Signal and Image Processing With Python

Course Contents for Signal processing

- Fundamentals of Signal Processing
- Analog to digital Conversion
- Sampling and Reconstruction
- Nyquist Theorem
- Convolution
- Signal Denoising
- Fourier Transform
- Designing of FIR Filters
- Designing of IIR Filter
- Wavelet Transform for Signals
- Implementation of all above techniques With Python

Course Contents for Image processing

- Fundamentals of Image Processing
- Arithmatic and Logical Operations With Images
- Geometric Operations with Images
- Gray Level or Point Level Transformation
- Histogram Processing
- Spatial Domain Filtering
- Frequency Domain Filtering
- Morphological Processing
- 2D Wavelet Transform

Who this course is for ?

- Anyone who wants to learn Signal and Image Processing from scratch using Python.
- Anyone who wants to work in Signal and Image Processing area.
- Those students who know the maths of Signal and Image Processing but don't know how to implement with Python
- Students who want to learn data and time series filtering, image filtering, image manipulation and different image processing techniques
- Students and practitioners who know implementation of signal and image processing algorithms in Matlab but want to switch to Python.

Signal Processing

Signal processing is the field of science which involves the manipulation of signal to get the desired shaping, transforming a signal from time domain to frequency and vice versa, smoothening the signal, separating the noise from signal i.e filtering, extracting information from the signal

Why Signal Processing ?

Since the availability of digital computers in the 1970s, digital signal processing has found its way in all sections of engineering and sciences.

Following areas of engineering and sciences are specially benefitted by growth and advancements in signal processing techniques.

Why Signal Processing ?

- Machine Learning
- Data Analysis
- Computer Vision
- Image Processing
- Communication System
- Power Electronics
- Probability and Statistics
- Time series Analysis
- Finance
- Decision Theory

Image Processing

Image processing is the branch of Science and Engineering in which we transform or modify the image using algotithms and digital machines.

Few of the important processing or transformations are

- Image Deblurring OR Sharpening
- Noise Removal
- Contrast Enhancement
- Edge Detection

Why Image Processing ?

Image Processing has found its applications in numerous fields of engineering and sciences.

Few of them are the following.

- Deep Learning
- Computer Vision
- Medical Imaging
- Radar Engineering
- Robotics
- Computer Graphics
- Face detection
- Remote Sensing
- Agriculture and food industry