



4th Floor , IDCO Tower, 1 - Janpath, Bhubaneswar
Phone : 0674 - 2542520
Cell : 9937094799 / 9937094791 / 9777243368

Image Processing

Basic Concepts

- What is digital Image Processing?
- Fundamental steps required for Digital Image Processing
- Components of an Image Processing System.
- Introduction Java Advance Imaging API and Installation

Digital Image Fundamental

- Image Acquisition
- CCD sensors array
- Basic concepts in sampling and quantization of image
- Representation of digital image
- Spatial and gray level resolution
- Zooming and shrinking algorithm
- Pixel geometry (adjacency, connectivity, regions and boundaries)

Image Enhancement in Spatial domain

- Grey level Transformations
- Image Negatives
- Log transformations
- Piecewise linear transformations
- Histogram processing
- Image subtraction and averaging
- Spatial filter development (sharpening and smoothing)

Image Enhancement in Frequency domain

- One dimensional and two dimensional Fourier transform and its inverse
- Filtering in frequency domain
- Correspondence between filtering in spatial and frequency domain
- Smoothing frequency domain filters
- Sharpening frequency domain filters
- Homomorphic filtering
- FFT Implementation

Image Restoration

- Noise models in images
- Spatial and frequency properties of noise
- Restoration in presence of noise using spatial and frequency filters
- Inverse filtering
- Mean filtering

Color Image Processing

- Color models
- RGB, CMY, CMYK, HIS
- Pseudo color image processing
- Color transformation
- Smoothing and sharpening
- Color segmentation
- Noise in colored Images
- Color image compression

Image compression

- Fundamentals
- Image compression model
- Elements of information theory
- Error free compression
- Lossy compression
- Image compression standards

Morphological image processing

- Some basic Morphological algorithms
- Extension to grayscale images

Image segmentation

- Detection of discontinuities
- Edge linking and boundary detection
- Thresholding
- Region based segmentation
- Segmentation by morphological water shades
- Use of motion in segmentation

Object Recognition

- Pattern and Pattern classes
- Recognition based on Decision-Theoretic Methods
- Structural methods