

DIGITAL IMAGE PROCESSING

MODULE-I

Fundamentals – Steps in digital image processing, sampling and quantization, relationship between pixels, imaging geometry

Image Transforms – Fourier Transform, Discrete Fourier Transform, Fast Fourier Transform, Discrete Cosine Transform, Walsh Transform, Hadamard Transform, Hotelling Transform.

MODULE-II

Image Enhancement – Point processing, spatial filtering (smoothing and sharpening filters), enhancement in frequency domain.

Filtering in the Frequency Domain: preliminary concepts, 2D DFT and its properties, basic filtering in the frequency domain, image smoothing and sharpening.

MODULE-III

Image Restoration and Reconstruction: Image restoration/degradation model, noise models, restoration in the presence of noise only, estimating the degradation function.

Color Image Processing: Color models, Color transformation.

MODULE-IV

Wavelets and Multi-resolution Processing: multiresolution expansions, wavelet transforms in one and two dimension.

Image Compression: Fundamentals, Some basic compression methods (Chapt: 8 of Text book 1)

Text books

- 1) Digital Image Processing, R.C. Gonzalez, R.E. Woods, Pearson Education , 3rd Edition, 2007
- 2) Digital Image Processing, S. Sridhar, Oxford University Press, 2011
- 3) Digital Image Processing And Analysis, B. Chanda, Dutta D. Majumder , PHI

Reference Books

- 1) Digital Image Processing using MATLAB, Rafael C. Gonzalez, Richard E. Woods Pearson Education, Inc., Seventh Edition, 2004.
- 2) Digital Image Processing, S. Sridhar, Oxford University Press, 2011
- 3) Digital Image Processing, William K. Pratt, John Wiley, New York, 2002