NITK –Surathkal
Department of Computer Science & Engineering
Course Plan

CO414 – Digital Image Processing

Name of the Course: Digital Image Processing	Course No: CO414	No. of Credits (L-T-P): 3-0-0 (3)
Year & Semester, Section: 2018, VII Sem	Course Type: Elective (PSE)	Academic Session: Odd

Prerequisites (if any): None

Course Syllabus

Introduction to image processing, applications, image sampling and quantization, basic relationship between pixels, basic gray level transformations, point operations, Histogram processing, Spatial operations, Convolution, image smoothing and sharpening, introduction to Fourier transform and frequency domain, Smoothing frequency domain filters, sharpening frequency domain filters, implementation of frequency domain filters, Noise models, Noise reduction in spatial domain, Noise reduction in frequency domain, state-of-the-art filters for denoising images corrupted with various kinds of noise, Morphological Image Processing, Image Segmentation, Color image Processing.

Course Objectives

1. To learn the fundamental concepts in digital image processing.
2. To analyze images in both spatial and frequency domains.
3. To design and implement image processing algorithms in MATLAB/Python.
4. Apply image processing algorithms in practical applications.

Course (Learning) Outcomes (COs)

CO1 – Understanding image formation process, related terminologies and image quality metrices.
CO2 – Should be able to apply basic image processing algorithms to analyse, enhance or segment given images and to use right tools to solve the given problem.
CO3 – Design and create practical solutions to common image processing problems.
CO4 – Enhance research skills through discussions and implementation of state-of-the-art techniques.

2. List of Text Books & Reference Books, On-line Course Resources

1. Rafael C. González, Richard E. Woods, "Digital Image Processing", 3rd Ed., PHI, 2007.
2. Anil K. Jain, “Fundamentals of Digital image Processing”, Prentice Hall, US Ed., 1989.
3. Rafael C. González, Richard Richard Eugene Woods, Steven L. Eddins, “Digital Image Processing using MATLAB”, Pearson Education India, 2004.
4. Willam K Pratt, Digital Image Processing, Wiley-Interscience Publication, Third Edition, 2001.
5. AL Bovik (Editor), “Handbook of Image and Video Processing”, Academic Press