

Centre for Technical Education

Second Semester 2012 – 2013

Course Handout

Course Name: Advanced Image Processing

Course Code: CTE C411

Instructor In-Charge – ARNAV GOEL

Co-Instructors – Ronak Gupta, Kushal Khandelwal

1. Course Description - This is an application oriented course on digital image processing. Starting with an introduction to the fundamentals of digital images, we discuss various discrete transforms extensively used in image processing. We will study Fourier transform techniques for image manipulation and enhancement. Following the transforms, we will work on algorithms dealing with image segmentation, object/ pattern recognition. We will also be discussing certain neural network algorithms for the development of system involving visual inputs. The course emphasises practical and hands-on learning, with assignments, projects and computer-based work in MATLAB/Octave.

2. Textbooks –

- a. Gonzalez, R. C. & R. E. Woods, Digital Image Processing, Prentice Hall India, 3rd Edition, 2008.
- b. Gonzalez, R.C, R.E Woods & Steven L. Eddins, Digital Image Processing using MATLAB, Pearson Education, 5th Edition, 2009

3. Course Plan

L. No.	Learning Objective	Chap/Sec
1	Concept of image enhancement	Chp 1,2
2-3	Gray Level Transformation ,Histogram Processing & Colour Maps for Images	Chp 3,Chp 6
4-5	Filtering in Spatial Domain	Chp 3
5-7	FFT,DFT & analysis in Fourier domain	Chp 4
8	Filtering in Fourier domain	Chp 4
9-10	Inverse filtering & Image Degradation Model	Chp 5
11-12	Morphological Image Processing	Chp 9
13-14	Introduction to Image Segmentation	Chp 10
15-16	Understanding Image Descriptors for Recognition	Chp 11

	Techniques	
17-18	Basic Neural Network Algorithms	Class Notes
19-20	Introduction of Pattern Recognition using Neural Networks	Chp 12

4. Evaluation Scheme

Comp No	Component	Duration	Weightage	Remarks
1	Midterm	1 hr	20 %	Open Laptop
2	Comprehensive	2 hr	30 %	Open Laptop
3	Lab work		25 %	Open Laptop
4	Assignments/ Projects/		25%	Open Book/Laptop

5. Pre- requisites – Course on Computer Programming in C/C++ language is the only pre-requisite.

*Note: The major emphasis of the course is the practical understanding of Image Processing & Pattern Recognition Systems using MATLAB/Octave. The objective is to make you learn to use tools of MATLAB/Octave related to IP & PR.

Make-up policy – This is applicable only in genuine case and it is up to the discretion of the instructors. No make-up for assignments.

Instructor in-charge

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