EE 481 – Digital Image Processing

Instructor: *Imran Siddiqi*
Contact: imran.siddiqi@mcs.edu.pk

Course Objectives

This course emphasizes the application of processing and analysis of digital images. The primary objective of the course is to provide students with the skills and knowledge to apply different kinds of processing on digital images in order to develop different application software.

Course Synopsis

The topics intended for the course have been outlined in the following.

- Introduction to Digital Image Processing, Computer Vision and Pattern Recognition
- Elements of visual perception, image acquisition, image sampling and quantization
- Image enhancement in the spatial domain: Gray level transformations, histogram processing smoothing and sharpening filters
- Image enhancement in the frequency domain – Fourier transform, Frequency domain filtering
- Image Segmentation: Detection of discontinuities, edges, boundaries, thresholding, region-based segmentation
- Morphological Image Processing: Image morphology, Dilation, Erosion and derived operators and transforms
- Color Image Processing
- Image Compression
- Pattern Recognition: Shape representation and description, clustering and classification

Course Composition

- The course will primarily comprise class room lectures, software demonstrations and lab sessions.
- Each student will also be required to go through the assigned reading material. Most of the reading assignments refer to the textbook mentioned in the section to follow.
- Handouts or other reading material and web tutorials would be made available once required.
- The students will be given assignments and quizzes regularly as well as a term project which they will document and demonstrate.

Assignments

- Assignments are to be submitted electronically *or* on paper as per instructions. Data files, if any, should also be submitted.
- All assignments must be submitted within the specified time frame. There will be a **25%** deduction for work submitted one day late. After one day the assignment will not be accepted.
- Although students are encouraged to work together on programs, this concept is limited to **HELP** only, that is; suggestions and conversations on methods of solving a problem; it does not include the copying of content/programs.
- Copied assignments will not be awarded any credit.

Quizzes

Announced/surprise quizzes of 10 to 15 minutes worth about 10 points will be given regularly.

Term Project

The students (in groups of 3 max.) will be assigned a term project the details of which will be made available later on.

Grading Scheme

Grades for this course will be based on the following point distribution which is pretty much standard.

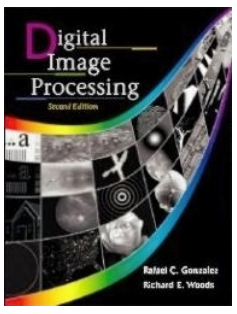
- Assignments: 10%
- Quizzes: 10%
- Midterm: 30%
- Final: 50%

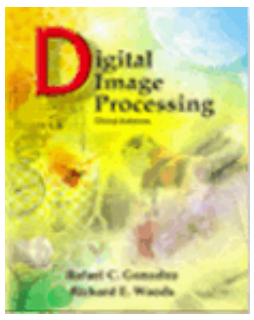
For grading scheme regarding your lab work, please contact the respective Lab Engineer.

Resources

Text Book

- ***Digital Image Processing,* Rafael C. Gonzalez & Richard E. Woods, Addison-Wesley**





Second Edition Third Edition

Reference Book

- ***Fundamentals of Digital Image Processing,* Anil K. Jain, Prentice Hall**

Online Resources

- **Will be made available from time to time.**

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