Course: Image Processing

Instructor: C. Y. Lee

Course description

Digital image processing involves the acquisition, enhancement, display, and understanding of digital images. This course is designed to give students a general understanding of the fundamentals of digital image processing and to provide them with hands-on experience in designing and programming image processing algorithms.

References

Digital Image Processing
Authors: R.C. Gonzalez, R.E. Woods
Publisher: Prentice Hall
ISBN: 0201508036

Digital Signal and Image Processing
Authors: Tamal Bose
Publisher: WILEY
ISBN: 0471452300

數位影像處理--運用 MATLAB
繆紹綱 / 東華書局
ISBN: 9574833364

Pattern Recognition Engineering
Authors: M. Nadler and E.P.Smith
WILEY-INTERSCIENCE
ISBN: 0471622931

Practical Algorithms for Image Analysis: Descriptions, Examples, and Code
Authors: M. Seul, L. O'Gorman, M.J. Samm
Publisher: Cambridge University Press
ISBN: 0521660653

Course Schedule

Intro to MATLAB

Image Transformation and Color

Improvement of Image Quality

Differentiation and edge detection

Thresholding and segmentation

Geometric pattern match -- Line detection

Geometric pattern match -- Circle detection

Geometric pattern match -- Hausdorff distance

Mid-Term

Non-Geometric pattern match -- Correlation(non-feature)

Non-Geometric pattern match -- K-L Transform(feature)
Texture
Clustering and applications
Image encoding and compression
Transformations
Image Tracking
Data Structures in Image processing and Computer vision
Final Project

Course evaluation

Passing score for graduate course is 70. In general, score is allocated between class attendance, homework, mid-term written exam, final written exam and student oral presentation. Course instructor reserves the right to adjust the grading scheme.