

COURSE DESCRIPTION -- "DIGITAL IMAGE PROCESSING (II)"

BACKGROUND: ECE 643 Digital Image processing (I)

TEXTBOOK: R. C. Gonzalez and R. E. Woods  
<Digital Image Processing>, Prentice Hall, 2002.  
Y. Q. Shi and H. Sun,  
<Image and Video Compression for Multimedia Engineering:  
Fundamentals, Algorithms and Standards>, CRC, 1999.

REFERENCES: D. H. Ballard and C. M. Brown, <Computer Vision>,  
Prentice Hall, 1982.  
J. S. Lim, <Two-Dimensional Signal and Image Processing>,  
Prentice Hall, 1990.

TOPICS: 1. Image compression: coding redundancy, interpixel  
redundancy, psychovisual redundancy, quantization,  
codeword assignment, waveform coding, transform coding,  
image model coding, interframe image coding,  
motion compensated coding, multiresolution image coding,  
color image coding, coding standards, JPEG2000, H.263, MPEG4.  
2. Image morphology: dilation, erosion, opening, closing,  
hit-or-miss transform, some basic morphological  
algorithms, extension to gray-scale images.  
3. Image representation and description: chain code,  
polygonal approximation, signatures, boundary segments,  
the skeleton of a region; shape number, Fourier  
descriptors, moments; topological descriptor,  
texture; relational descriptors.  
4. Image recognition and interpretation: elements of  
image analysis; patterns and pattern classes;  
decision-theoretic methods, matching, optimum statistical  
classifiers, neural networks; structural methods, matching  
shape numbers, string matching, syntactic methods;  
interpretation, types of knowledge, predicate calculus,  
semantic networks, production (experts) systems.

COMPUTER ASSIGNMENTS:

Two or three

GRADING POLICIES:

1. Computer assignments:	15%
2. Homework (given problems):	15%
2. Course project:	20%
3. Final examination:	50%

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