Syllabus ELEN 642, Fall 2007
Digital Image Processing

Instructor: Jim Ji, WREC 236B (979) 458-1468 (office), 458-4521 (Lab) E-mail:
jimji@tamu.edu   Lab office at Magnetic Resonance Systems Lab: USB 109 (old TI
building). See lab on map here: `http://www.ece.tamu.edu/~mrsl/maps.htm`
Grader: Yuttapong (A) Jiraraksopakun   E-mail: yuttapong@tamu.edu
For hw and project submission: JYUTTAPONG@GMAIL.COM.

Office Hours: Half hour after class or by appointment. Most of the time I work in Magnetic
Resonance Systems Lab in USB building room 109. If you want to catch me there, you
may stop by any time. Just email me or call me before you come.

Prerequisite:
ELEN 444, or permission of the instructor.

Lectures: Monday Wednesday Friday 10:20AM-11:10AM ZACH 128A

URL: `http://www.ece.tamu.edu/~jimji/ELEN642/` Click courses and follow the links.
Grades and notes will be linked to secured elearning.tamu.edu webct server. You'll need
neo id and password to access it.

Textbook:
Rafael C. Gonzalez and Richard E. Woods, Digital Image Processing, Addison Wesley,
2nd edition.

Companion website: http://www.imageprocessingplace.com/

References:
A. Jain, Fundamentals of Digital Image Processing, Prentice-Hall, 1989
Oppenheim and Schafer, Discrete-Time Signal Processing, Prentice-Hall, 1989

Journals:
IEEE Transactions on Image Processing
IEEE Transactions on Medical Imaging
(Many more on `http://www.ee.tamu.edu/~jimji/links-journalsliteratures.htm`, most have online access)

Grading:
The final grade will be determined from the weightings
Exams	= 20%
Quiz	= 10%
HWs	= 30%
Projects	= 40%

Guaranteed: 90-100 A, 80-89 B, 70-79 C, 60-69 D, Below 60 F. Any curve will lower these
ranges.

Homework and Projects:
The hw and projects will be assigned approximately every other Wednesday, which will typically be due in two weeks. The lowest hw score will be dropped. Late HW and project will be panelized by 33% per day, and by 100% once the solutions are posted. There will be weekly popup quizzes. You will have an opportunity to present a final project on digital image processing to the class in the end of the class.

Test:
There will be one midterm. It will be closed book but you are allowed to bring a two-sided 8.5 by 11-inch handwritten note.

Topics:
- Review of elementary digital signal processing concepts
- Two-dimensional (2D) signals, 2D sampling, and 2D transforms
- Human visual perception
- Image formation:
    a. Video scanning
    b. Tomographic imaging
    c. Remote sensing/SAR
- Image rendering/display
    a. Printing
    b. Electronic display
- Image enhancement and restoration
    a. Processing in spatial domain
    b. Processing in transformed domain
- Morphological image processing
- Genomic image processing (guest lectures if possible)
- Image and video coding/compression
- Image analysis and recognition
    a. Image segmentation and clustering
    b. Image registration
    c. Quantitative analysis
- Review and project presentation

Classroom Behavior: Please be courtesy to your classmates and instructor. Setting your cell phone and beeper to mute mode is required in class.

Students Needing Support Services:
The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please contact the Department of Student Life, Services for Students with Disabilities, in Room 126 of the Koldus Building or call 845-1637.