Handout #1
Jan 09, 2007

ECE 178: Digital Image Processing

Instructor: Manjunath. Rm 3157 Engr I; 893-7112; manj@ece.ucsb.edu
Teaching Assistants: Emre Sargan and Anindya Sarkar.
Lectures: T & R, 8-915AM; Discussion Sessions: Fridays 12-1250PM and 1-150PM.
Office Hours:

      Tuesday 915-1015AM and Thursday 11am-12 noon (Manjunath)
      M 12noon-1PM (Anindya, TA Office)
      T 12-1 PM (Emre, TA Office)
      W 2-3 PM (Emre, TA Office)
      R 12 - 3 PM (ECI LAB, Anindya/Emre)
      F 2-3PM (Anindya, TA Office)

Text Book: There are no required text books for this class (this is a departure from previous years when I used the DIP book by Gonzalez & Woods). I highly recommend Digital Image Processing (http://www.imageprocessingplace.com) by Gonzalez and Woods as a reference book, and several copies of this book are available in the library reserve section. The book's web site contains pointers to additional resources and you are encouraged to take a look. For reference, I indicate the chapters from this book (see syllabus below) but I will be using materials from several sources—it is important that you attend the lectures and take good notes. There is a companion book, Digital Image Processing using Matlab, that emphasizes more of the MATLAB usage than the theory part.

About the course: ECE 178 is an introductory course in image processing. In this course, you will learn about digital images and how you can manipulate them. Open to students in Engineering. You should have good background in basic calculus. Preliminary topics such as basics of linear systems, linear and circular convolution, and 2-D Fourier transform will be introduced during the first two weeks. You are expected to learn and use MATLAB and the Image Processing Toolbox for your programming assignments. *No prior knowledge of MATLAB is assumed*.

Grading Ploicy: 20% HWs, 20% Mid-term examinations, 10% quiz (surprise! in class & discussion sessions), and 50% for the final examination. All home-works are required (*a non-submission will affect your grade non-linearly*). The home works are due by 5 PM on the day they are due, in the HW box. *Those that are received late will not be graded and will not get any credit.*

Important Dates:
Mid-term exam I: Feb 1 (Thursday), in class.
Mid-term exam II: Feb 27 (Tuesday), in class.
Final Exam: 8-11 am, March 23 (Friday), 2006.

Syllabus:
1. Introduction (Read: Ch. 1 & 2; brightness adaptation and discrimination; image sensing and acquisition; image sampling and quantization; spatial and gray level resolution; aliasing; basic relationship between pixels.) MATLAB introduction.
2. Linear systems review (notes).
3. Sampling and quantization (notes).

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4. Image Enhancement: spatial (Chapter 3)
5. Image Enhancement: frequency (Chapter 4)
6. Color Image Processing (Chapter 6)
7. Wavelets (Chapter 7)
8. Image Compression (Chapter 8)