Course: MAIT 623 – Modern Mathematical Methods of Signal and Image Processing I
Semester: Choose an item. Year: Choose an item.
Day(s): Thursday
Time: 4:00-6:40 pm
Location: JMP 2216
Instructor: Alfredo Nava-Tudela, Ph.D.
Phone: 301-405-4843
Email: ant@umd.edu

Course Description

Course content/objective:
Introduction to current signal/image processing techniques, including wavelets and frames, in the context of applied and numerical harmonic analysis. Topics include time-frequency and time-scale representations, sparse signal representations, and applications to compression and denoising.

ELMS Site or Course Webpage:
http://terpconnect.umd.edu/~ant/mait623/

Required Technology:
Since homework and the class project will require Matlab, you will need access to a computer with Matlab. I recommend the following two Matlab primers if you are not familiar with this programming language:
http://www.math.toronto.edu/mpugh/primer.pdf

Prerequisites:
Must have knowledge of advanced calculus and applications. Familiarity with matrix/vector computations and linear algebra will be a plus. Matlab will be assumed as a common language.

Method for Communication with Students Outside the Classroom:
Office hours: Tuesday 4:00-5:00pm, Friday 12:00-1:00pm, and by appointment, in CSS 4359. Email is welcome anytime! (ant@umd.edu)

Emergency Protocol:
Common sense will apply in case of emergencies, so please talk to me or email me as soon as possible in case of an unforeseen circumstance.

Statement of Course Goals and/or List of Student Learning Outcomes:
The student will become familiar with a variety of signal processing techniques with examples geared toward image processing applications with emphasis on sparse representations.

Course Schedule:
Thursdays 4:00-6:40pm JMP 2216

Due Dates:
All homework and programming assignments are due at the beginning of class a week from when they are assigned. See Grading Procedures below.

Expectations for Students:
Assignments, course notes, answers to homework and quizzes, and announcements will be posted on the course’s homepage. You are responsible for checking this site before each class. All work that you submit in this course must be your own; group efforts will be considered academic dishonesty. You may discuss homework in a general way, but you may not consult any one else’s written work, program drafts,
computer files, etc. Any marked similarity in form or notation between submissions with different authors will be regarded as evidence of academic dishonesty – so protect your work. You are free to use reference material to help you with assignments, but you must cite any reference you use and clearly mark any quotation or close paraphrase that you include. Such citation will not lower your grade, although extensive quotation might.

Grading Procedures:
Your grade will be based on homework (including programming projects), quizzes, and a final project. No final exam. Grading will be on a curve, except that you will be guaranteed an A- if your average is 90% or better, a B- if your average is 80% or better, etc. Keep all of your work in case there is any question about recording of grades.
Homework - One week will be allowed for each assignment. Partial credit will be given for partially-working programs. There will be a 15% penalty for assignments turned in up to 2 days late, 30% penalty for assignments turned in 2-4 days late, etc.
Quizzes - There will be 7 quizzes given, the worse quiz grade will be dropped and the remaining best 6 grades will be considered. No make-ups unless you miss more than 2 quizzes and you have a valid written justification for missing a class when a quiz was scheduled. See Written Absence Policy below.
Class project - You will choose from a pool of projects to work on and give an optional in-class final presentation. More details by mid-semester.

Course Attendance/Participation Policy:
You are expected to attend class the days quizzes are scheduled, or when presenting your project, see Grading Procedures above.

Written Absence Policy:
Documentation of a valid reason for missing class must be provided as soon as possible in order to qualify for a make-up quiz.

Arrangements for Students with Disabilities:
If you require academic accommodations due to a religious obligation or a disability, you must provide documentation by the end of the 2nd week of the semester.

Textbook(s)
  -Required: Yes.
  -Required: No.

Course Outline
See class website for details.

Code of Academic Integrity
The University of Maryland, College Park has a nationally recognized Code of Academic Integrity, administered by the Student Honor Council. This Code sets standards for academic integrity at Maryland for all undergraduate and graduate students. As a student you are responsible for upholding these standards for this course. It is very important for you to be aware of the consequences of cheating, fabrication, facilitation, and plagiarism. For more information on the Code of Academic Integrity of the Student Honor Council, please visit http://shc.umd.edu/SHC/HonorPledgeInformation.aspx.