Course Description: Spectrum estimation involves the identification of the characteristics of a signal or system. Hence spectrum estimation has a multitude of applications ranging from direction finding in spatial arrays to interference rejection in wireless communications systems. This course covers both classical methods and newer approaches which are now used extensively in communications and signal processing. The course stresses applications and assumes some prior knowledge of adaptive filtering and linear estimation theory.

Time: MW 3:00-4:20

Location: Caruth 129

Instructor: Carlos E. Davila, 328c Caruth Hall
Office Hours Tu, Th 2:00-5:00
Phone (214) 768-3197
email cd@seas.smu.edu


Topics:  I. Review of Matrix Algebra and Probability Theory
IV. Array Processing and Direction Finding: A. Array geometry B. Subspace Methods C. Pisarenko D. Minimum Norm E. MUSIC F. ESPRIT G. Kumasaran-Tufts
VI. Wavelets: A. Filter Banks B. Discrete Wavelet Transform C. Continuous Wavelet Transform D. Wavelet Frames E. Wavelet Compression
VII. Time-Frequency Distributions: A. Wigner B. Kernel Methods C. Applications

Grading Policy: Programming Assignments 60%
Project 20%
Final Exam 20%

SMU Incomplete Grades Policy

An Incomplete (I) may be given if the majority of the course requirements have been completed with passing grades but for some justifiable reason, acceptable to the instructor, the student has been unable to complete the full requirements of the course. Before an (I) is given, then instructor should stipulate in writing to the student the requirements and completion date that are to be met and the grade that will be given if the requirements are not met by the completion date. The
maximum period of time allowed to clear the Incomplete grade is 12 months (except for graduate thesis and dissertation courses). If the Incomplete grade is not cleared by the date set by the instructor or by the end of the 12-month deadline, the (I) may be changed to an F or to another grade specified by the instructor. The grade of (I) is not given in lieu of an F, WP, or other grade, each of which is prescribed for other specific circumstances. If the student’s work is incomplete and the quality has not been passing, and F will be given. The grade of (I) does not authorize the student to attend the course during a later semester. Graduation candidates must clear all Incompletes prior to the deadline in the official University Calendar, which may allow less time than 12 months. Failure to do so can result in removal from the degree candidacy list and/or conversion of the (I) to the grade indicated by the instructor at the time the (I) was given.