SIO 207B / ECE 251A: Digital Signal Processing I

Instructor:

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Course Description:

Discrete random signals; conventional (FFT based) spectral estimation. Coherence and transfer function estimation; model-based spectral estimation; linear prediction and AR modeling. Levinson-Durbin algorithm and lattice filters, minimum variance spectrum estimation.

Summary of Topics Discussed:

(1) Inverse filtering and channel equalization.
(2) Hilbert transforms. Homomorphic signal processing.
(3) Discrete random sequences.
(4) Conventional power spectral estimation.
(5) Coherence and transfer function estimation.
(6) Statistical properties of time series.
(7) High resolution spectral analysis.
(8) Speech processing.

Homework/Projects:

Approximately one computer-oriented homework assignment will be made per week. These can be worked on in groups and should be turned in as soon as possible for feedback. A mid-term and an end-term project will be assigned. These should represent individual effort (i.e. should be considered as take-home exams) and assistance should not be given nor received from anyone other than the instructor.

Grades:

No exams will be given. Grades will be assigned based on the weekly homework assignments and the mid/end-term projects. The homework assignments count 1/3 and the mid/end-term projects count 1/3 each. The class can be taken either for a letter grade or S/U.

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