EC3410 - Discrete-time Random Signals

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office hours: posted or by appointment

Text: Discrete random signals and statistical signal processing, C.W. Therrien

Course outline:

1) Review of random concepts
2) Random processes: Bernouilli, random walk, Gaussian processes
3) Second moment analysis: time, frequency and z domains, correlation function and matrix, periodic process, white noise,
4) Estimators: mean and variance
5) Linear transformations: definition, eigendecomposition, DKLT transform
6) Spectral factorization, innovations representation, matched filter
7) Orthogonality principle, Wiener optimal filtering: FIR and IIR filtering
8) Matched filter

Grades: 2 tests each worth 20%
1 comprehensive final, worth 20%
projects: worth 40%

HWs: A few problems will be assigned on a regular basis to apply the various concepts covered in the classroom. Hws will not be collected, however they constitute an essential part of the learning process for the course. You are responsible for working on the problems as they get assigned to facilitate the understanding of the concepts covered in class. Solutions will be made available.

Exams: Tests will be closed books/notes. You will be allowed to bring in one one-sided (8.5*11") sheet on which you may write whatever you feel may be useful to you. For the final you will be allowed to a two-sided (8.5*11") sheet of notes.

Exam schedule:

Thursday 10/31
Tuesday 11/26

Make-up classes:
There will be no class 10/14-16. Make-up times will be announced in class.

Projects: Several MATLAB-based computer projects will be assigned during the quarter. Data will be made available on the network for class/project use when appropriate. Written reports will be used for grading.