ESE 524 Detection and Estimation Theory

Semester: Spring 2018
Time: Tuesday and Thursday 2:30PM-5:30PM
Classroom: Louderman / 458

Instructor Information
Name: Arye Nehorai
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Office Hour: Thursday 4:00 - 5:00 pm, Green hall 2160c (by appointment)

TA Information
Name: Eric Cawi
Email: ezcawi@wustl.edu
Office Hour: Monday and Wednesday 5:30 - 6:30 pm, Green hall 2120A

Prerequisite
ESE 520 Probability and Stochastic Processes or equivalent

Course Outline
- Estimation Theory
  - Estimator Performance
  - Sufficient Statistics
  - Cramér–Rao Lower Bound
  - Linear Models
  - Maximum-Likelihood (ML) estimation
  - Bayesian Inference
    - Noninformative Priors
    - Bayesian Inference for Multiparameter Models
    - Gaussian Linear Models
    - Bayesian Asymptotic
  - Kalman Filter
- Detection Theory
  - Bayesian Detection
    - Chernoff Bound
    - Multiple Hypothesis Testing
  - Frequentist Detection
    - Neyman-Pearson Test for Simple Hypotheses
    - Composite Hypothesis Test
Assignments
In most cases assigned biweekly on Tuesdays, starting from the second week. Due within two weeks in class. Knowledge in Matlab programming is required. The graded solutions will be returned in one or two weeks. Homework problems, solutions, and grades will be posted on Blackboard.

Exam Schedule
Midterm exam: Tuesday, March 20, 2018, 2:30PM-4:00PM
Final exam: Monday, May 7, 2018, 3:30PM - 5:30PM

Course Grading
Homework 25%
Midterm 25%
Final exam 50%

Grader Information
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Notes Readings (Required)
https://sites.google.com/view/detestth/lecture-notes?authuser=0

Reading List (Suggested)