Lecturer: Huseyin Özkan, hozkan@sabanciuniv.edu
Room: FENS 1107, Phone: x9594.


Lecture Hours: Monday 8:40-10:30, Tuesday 8:40-9:30. (will change)

Office Hours: By appointment (please drop an email to arrange one).

Course Objectives: To provide students the fundamentals of detection and estimation theory and a grasp of the recent developments in research.

Prerequisite: Random Processes or Pattern Recognition.

Grading Policy: Midterm 1, 20%; Midterm 2, 20%; Final 25%; Assignments, 20%; Paper presentations, 15%.

Topics and Schedule (tentative):

- Chapter 1: Introduction to Detection and Estimation (4 weeks)
  Bayesian, minimax, Neyman-Pearson and composite hypothesis testing
  Uniformly most powerful test and generalized likelihood ratio test (GLRT)

- Chapter 2: Detection in discrete time (4 weeks)
  Deterministic signals and independent noise
  Deterministic signals and Gaussian noise
  Detection of signals with random parameters
  Detection of stochastic signals
  Selected topics: Change detection, sequential detection, CFAR and GLRT

- Chapter 3: Estimation (6 weeks)
  Bayesian approach: MMSE, MMAE, MAP and extensions to vector parameters
  Nonrandom approach: Sufficiency and MVUE
  Estimator variance: ML Estimation