Lecturer: Hüseyin 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