

Sabancı University
Faculty of Engineering and Natural Sciences
EE 568 - Detection and Estimation

Fall 2020-2021
Course Information

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| Lecturer | : Hüseyin Özkan, hozkan@sabanciuniv.edu Room: FENS 1107, Phone: x9594. |
| Textbook | : H. Vincent Poor, An Introduction to Signal Detection and Estimation (Second Edition), Springer, 2013. |
| 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 | : Midterm1, 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