Portland State
UNIVERSITY

ECE539/639 - Statistical Signal Processing II: Linear Estimation

Course Description

Unified introduction to the theory, implementation, and applications of statistical signal processing methods. Focus on optimum linear filters, Wiener filters, least squares, adaptive filters, LMS and RLS algorithms, and the Kalman filter. Example applications in system identification, noise canceling, signal enhancement, and adaptive equalization. Designed to give a solid foundation in the underlying theory balanced with examples of practical applications and limitations.

Prerequisite:	ECE 538/638 or equivalent, MATLAB
Instructor:	Eric A. Wan Room: FAB 20-16, phone: (503) 725-9041, e-mail: eric.wan@pdx.edu
Class:	T/TH 4:40-6:30PM, FAB 40-09
Office Hours:	W 3-4PM, FAB 20-16
Web Page:	http://web.cecs.pdx.edu/~ericwan/ece539/
Grading:	Homework-30%, Three-quarter term-30%, Project-40%
Required Text:	*Statistical and Adaptive Signal Processing,* Dimitris G. Manolakis, Vinay K. Ingle, and Stephen M. Kogon, Artech House, Inc., 2005, ISBN 1580536107.
Recommended Text:	*Adaptive Filter Theory,* Haykin, Prentice-Hall *Adaptive Signal Processing*, Widrow, Stearns, Prentice-Hall *Fundamentals of Statistical Signal Processing*, S. Kay, Prentice-Hall

Tentative Course Outline and Topics:

1. Review of Probability and Random Processes
2. Linear Estimation and Wiener Filtering
3. Least Squares
4. Linear Prediction
5. Adaptive Filters – LMS and RLS
6. Applications
7. Discrete-Time Kalman Filtering
8. Project Presentations