



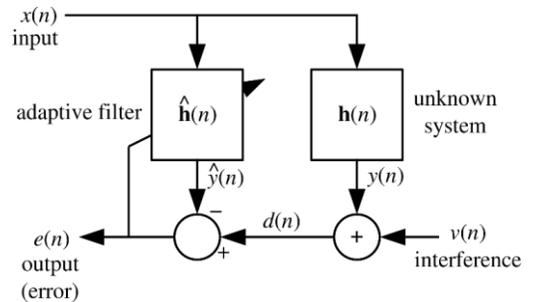
SAN DIEGO STATE
UNIVERSITY

Department of Electrical and Computer Engineering

EE654: Adaptive Filter Design (Online)

Instructor: Dr. Ashkan Ashrafi

Adaptive filters are important parts of modern communication systems and advanced audio systems including modems, wireless systems, RADARs and active noise cancelling headphones. In this course, fundamentals of adaptive filters are covered after reviewing background requirements. The course focuses on theoretical background of adaptive filters as well as their applications. The covered topics include review of stochastic processes and linear algebra, continuous-time and discrete-time Wiener filters, the LMS algorithm and its variations, the RLS algorithm, applications of adaptive filters in channel equalization, noise and echo cancelation, system identification and beamforming. MATLAB is used to show the implementation of the algorithms and examples are provided to help students better understand the concepts. Students should have some background in random processes, digital filter design and linear algebra.



The video lectures are available online. Homework assignments are given almost biweekly. Project assignments, midterm and final exams are all take-home and can be submitted online. Students can either attend the lectures on campus or watch them online. They can also ask their questions either by coming on campus during instructor's office hours or via email.



Professor Ashrafi received his BSc and MSc degrees in Electronics Engineering from K.N.Toosi University of Technology, Tehran, Iran and MSE and Ph.D. degrees in Electrical Engineering from the University of Alabama in Huntsville, Huntsville, AL, USA in 1991, 1995, 2003 and 2006, respectively (all with the highest honor). He joined the Electrical and Computer Engineering Department at SDSU in Fall 2007 where he is currently an Associate Professor and the director of the Signal Processing Research Laboratory. His research interests are digital and statistical signal processing, graph theory and graph signal processing, estimation theory, biomedical signal processing, brain connectivity analysis and audio processing.

Professor Ashrafi is the recipient of Outstanding Faculty Award of the Department of Electrical and Computer Engineering, San Diego State University in both 2012 and 2013. He served as an associate editor for IEEE Transactions on Circuits and Systems Part-I: Regular Papers between 2011 and 2014 and received the Best Associate Editor Award in 2013. During his graduate studies, he also received the 2005 Iliana Martin Chittur Outstanding Graduate Student Award and the 2005 National Engineer's Week Outstanding Graduate Student Award from the College of Engineering, University of Alabama in Huntsville. He is a member of Phi-Kappa-Phi, Sigma-Xi and Eta-Kappa-Nu honor societies.