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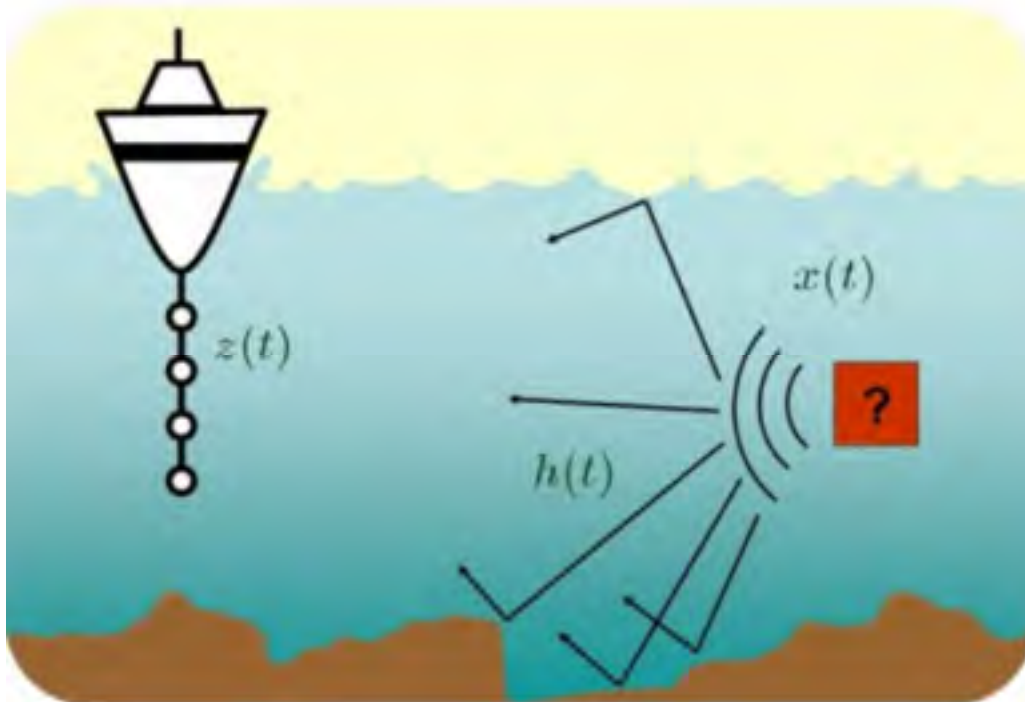
Center for **IMAGING** SCIENCE

Seminar Series

Joint Deconvolution and Classification

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4pm, Wed., Feb. 6, 2008

Auditorium of the Center for Imaging Science

One standard approach for classifying an LTI-corrupted signal is to estimate the original signal using a blind deconvolution technique, then classify the estimated original signal. However, blind deconvolution is difficult and often ill-posed. We propose treating the deconvolution and classification problems jointly. We demonstrate the proposed methods for identifying marine mammals from their vocalizations. Lastly, we discuss how the proposed methods could be used for imaging given random LTI filtering.

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Abstract

Consider the problem of classifying a signal that has been corrupted through an unknown linear time-invariant (LTI) system, for example, classifying an image that has been blurred or classifying a THz echo that has propagated through an absorptive media such as humid air.

One standard approach is to estimate the original signal using a blind deconvolution technique, then classify the estimated original signal. However, blind deconvolution is a difficult and often ill-posed problem. We propose treating the deconvolution and classification problems jointly. We present and contrast a nearest-neighbor approach, a MAP approach, and a quadratic discriminant analysis approach to joint deconvolution and classification. Our experiments focus on classifying passive acoustic signals and we demonstrate the proposed methods on a problem of identifying marine mammals from their vocalizations in shallow water. Lastly, we discuss how the proposed methods could be used for imaging given random LTI filtering.

Speaker Bio

Maya Gupta completed her Ph.D. in Electrical Engineering in 2003 at Stanford University as a National Science Foundation Graduate Fellow, after taking a BS in Electrical Engineering and a BA in Economics from Rice University in 1997. From 1999-2003 she worked for Ricoh's California Research Center as a color image processing research engineer. In the fall of 2003, she joined the EE faculty of the University of Washington as an Assistant Professor. She was awarded the 2007 Office of Naval Research Young Investigator Award and the 2007 Univ of Washington Dept. of Elec. Engineering Outstanding Teaching Award. More information about her research is available at her group's webpage: <http://idl.ee.washington.edu>.