

EE Department Seminars

(Acceptable as EE 579 and SCO 579 seminars)

December 11, 2009, Friday, 11 a.m.
Yorgo Istefanopulos Meeting Lounge (KB 217)

Joint Channel Estimation and Resource Allocation for MIMO Systems

Alkan SOYSAL, Assistant Professor

Department of Electrical and Electronics Engineering, Bahçeşehir University - İstanbul

Multiple antenna systems are known to provide very large data rates, when the perfect channel state information (CSI) is available at the receiver. However, this requires the receiver to perform a noise-free, multi-dimensional channel estimation, without using communication resources. In practice, any channel estimation is noisy and uses system resources. We shall examine the trade-off between improving channel estimation and increasing the achievable data rate. We consider transmit-side correlated multi-input multi-output (MIMO) channels with block fading, where each block is divided into training and data transmission phases. The receiver has a noisy CSI that it obtains through a channel estimation process, while the transmitter has partial CSI in the form of covariance feedback. In this talk, we will consider single-user and multi-user resource allocation problems, and optimize the achievable rate jointly over parameters associated with the training phase and data transmission phase. In particular, we first choose the training signal to minimize the channel estimation error, and then, develop an iterative algorithm to solve for the optimum system resources such as time, power and spatial dimensions.

Alkan SOYSAL received the B.S. degree in electrical and electronics engineering from Middle East Technical University, Ankara, Turkey in 2002, and the M.S. and Ph.D. degrees in electrical and computer engineering from University of Maryland, College Park, MD in 2006 and 2008 respectively. He joined Bahçeşehir University, İstanbul, Turkey in February 2008 as an Assistant Professor in the Department of Electrical and Electronics Engineering. His research interests are in wireless communication theory, information theory and signal processing for wireless communications with particular focus on MIMO networks.