

Seminar on

Cooperative MIMO Communication in a Measured Urban Macrocellular Environment

by

Prof. Michael A. Jensen

Brigham Young University, Provo, UT 84602, USA

Abstract

The use of multiple antennas to improve wireless communication performance has received considerable attention, with much of the work over the past decade focusing on multiple-input multiple-output (MIMO) techniques. However, in certain applications, the nature of the electromagnetic propagation makes it difficult for MIMO communication to effectively improve performance. For example, the elevated position and sectored nature of the antennas at a base station leads to limited observed angular spread of the multipath propagation that dramatically reduces the effectiveness of MIMO processing. One potential solution to this problem involves using multiple base station sites working cooperatively, a solution that also potentially enables significant benefit in terms of interference control in multi-user signaling. We report on the analysis of fully-coherent measurements from three base station sites to a single mobile station in a macrocellular environment. The observed channels are used to explore the gains achieved with cooperative MIMO signaling to a single user and to multiple users. The analysis includes application of new signal processing algorithms that allow exploration of the performance for different system capabilities (linear or nonlinear receivers, different transmission power constraints, etc.). This analysis shows that cooperative MIMO signaling can provide multi-user throughput gains that are significantly higher than what can be achieved using more traditional multiple-access strategies under favorable channel conditions.

Biography

Michael Jensen received the B.S. and M.S. degrees in Electrical Engineering from Brigham Young University (BYU) in 1990 and 1991, respectively, and the Ph.D. in Electrical Engineering from the University of California, Los Angeles in 1994. Since 1994, he has been at the Electrical and Computer Engineering Department at BYU where he is currently Professor. He has published over 230 articles and book chapters on the topics of antennas, propagation, and signal processing for wireless communication, with emphasis on multi-antenna communication systems. He has been recipient of the Best Student Paper Award at the IEEE Antennas and Propagation Society Symposium in 1993, the H. A. Wheeler Applications Prize Paper Award in the *IEEE Transactions on Antennas and Propagation* in 2002, and several outstanding faculty awards at Brigham Young University. He was elevated to the grade of IEEE Fellow in 2008.

He has served as Chair of his department, as the Technical Program Chair or General Co-Chair for 8 different symposia, as a member and chair of the IEEE Antennas and Propagation Society Joint Meetings Committee, and as an elected member of the IEEE Antennas and Propagation Society AdCom. He has been an associate editor of the *IEEE Transactions on Antennas and Propagation* and the *IEEE Antennas and Wireless Propagation Letters*, and he currently serves as the Editor-in-Chief of the *IEEE Transactions on Antennas and Propagation*.

Date : 16 Jan., 2013 (Wednesday)
Time : 03:00pm – 04:00pm
Venue : G6302, 6/F, Green Zone, Academic 1,
City University of Hong Kong

*** ALL ARE WELCOME ***