Cooperative Multi-Cell Networks: Impact of Limited-Capacity Backhaul and Inter-Users Links

Abstract: Cooperative technology is expected to have a great impact on the performance of cellular or, more generally, infrastructure networks. Both multicell processing (cooperation among base stations) and relaying (cooperation at the user level) are currently being investigated. In this presentation, recent results regarding the performance of multicell processing and user cooperation under the assumption of limited-capacity inter base-station and inter-user links, respectively, are reviewed. The survey focuses on related results derived for non-fading uplink and downlink channels of simple cellular system models. The analytical treatment, facilitated by these simple setups, enhances the insight into the limitations imposed by limited-capacity constraints on the gains achievable by cooperative techniques. (Joint work with Osvaldo Simeone, Shlomo Shamai (Shitz), and H. Vincent Poor)

Bio: Oren Somekh: received the B.Sc., M.Sc., and PhD degrees in electrical engineering from the Technion-Israel Institute of Technology, Haifa, Israel, in 1989, 1991, and 2005, respectively. During 1991-1996 he served in the Israel Defense Forces (IDF) in the capacity of a Research Engineer. During 1998-2002 he was the Vice President of Research and Development and later Chief Technical Officer (CTO) of Surf Communication Solutions Ltd., Yokneam, Israel. From April 2005 to October 2006 he was a Visiting Research Fellow at the Center for Wireless Communications and Signal Processing Research, NJIT, Newark, New Jersey. Since November 2006 he has been a Visiting Research Fellow at the Electrical Engineering Department of Princeton University, Princeton, New-Jersey. Dr. Somekh is a recipient of the Marie-Curie Outgoing International Fellowship (OIF). His main research interest is information theoretical aspects of cooperative wireless networks.