Guest Lecture

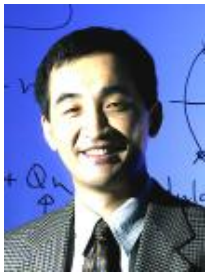
"Base Station Assignment and Transceiver Design for Heterogeneous Networks"

Prof. Zhi-Quan (Tom) Luo
Department of Electrical Engineering and Computer Engineering
University of Minnesota, Twin Cities, USA

Monday, 10 June 2013
10:00 am - 11:30 am
BAR II/63 A

Abstract: We consider the interference management problem in a multicell MIMO heterogenous network. Within each cell there is a large number of distributed micro/pico base stations (BSs) that can be potentially coordinated for joint transmission. To reduce coordination overhead, we consider user-centric BS clustering so that each user is served
by only a small number of (potentially overlapping) BSs. Thus, given the channel state information, our objective is to jointly design the BS clustering and the linear beamformers for all BSs in the network. In this talk, we formulate this problem from a sparse optimization perspective and analyze its computational complexity. We show that this problem is NP-hard in general and identify cases where the problem is polynomial time solvable to global optimality. For the general problem setting, we propose an efficient algorithm that is based on iteratively solving a sequence of group LASSO problems.
A novel feature of the proposed algorithm is that it performs BS clustering and beamformer design jointly rather than separately as is done in the existing approaches for partial coordinated transmission.

ZHI-QUAN TOM LUO received his PhD in Operations Research from MIT in 1989. He was with the McMaster University, Canada, from 1989 to 2003, where he served as the Head of the ECE Department and held a Canada Research Chair in Information Processing. Since 2003 he has been with the ECE Department at the University of Minnesota (Twin Cities) as a full professor and holds an endowed ADC Chair. His research interests include optimization algorithms, signal processing and digital communication. Prof. Luo is a Fellow of IEEE and SIAM. His current professional activities include Editor-in-Chief: IEEE Transactions on Signal Processing (2012-Present);Editorial Board Member: IEEE Signal Processing Magazine*(2010-2012) and IEEE Journal of Selected Topics of Signal Processing (2013-Present); Associate Editor: Mathematics of Operations Research, INFORMS, (2007-Present) and Management Sciences (2009-Present); Member/Vice Chair/Chair/Past Chair: SPS Signal Processing for Communications and Networking Technical Committee (2005-Present); Member: SPS Publications Board (2012-present). Dr. Luo is a recipient of the 2004, 2009 and 2011 IEEE SPS Best Paper Award, the 2011 EURASIP Best Paper Award and the 2011 ICC Best Paper Award. He was awarded the Farkas Prize from the INFORMS Optimization Society in 2010.



We are looking forward to welcoming you to this lecture and an inspiring discussion.