

Title: Multi-Cell Cooperation in Cellular Networks: A Stochastic-Geometry Perspective

Speaker:

Dr. Kaibin Huang
School of Electrical and Electronic Engineering,
Yonsei University, Korea

Date: Tuesday, 16 August 2011
Time: 11:00 am - 12:00 noon
Venue: Room 603, Chow Yei Ching Building

Abstract:

Multi-cell cooperation is a key approach for mitigating inter-cell interference in next-generation wireless communication networks. Quantifying the performance of multi-cell cooperation is challenging as it integrates physical-layer techniques and the network topology. For tractability, existing work typically relies on the over-simplified Wyner-type models and thereby fails to predict accurately the performance of multi-cell cooperation in practice. In this talk, I will discuss a new stochastic-geometry model for a cellular network with multi-cell cooperation, which accounts for practical factors including the irregular locations of base stations and the resultant path-losses. Using this model, the outage probability of mobiles will be analyzed by combining mathematical tools from stochastic geometry and large-deviation theories. Specifically, the effects of fading, power control and fractional frequency reuse on the outage probability will be quantified, yielding new insight into the fundamental limit of multi-cell cooperation.

Biography of the Speaker:

Kaibin Huang is an assistant professor in the School of Electrical and Electronic Engineering at Yonsei University, Korea. He was a postdoctoral research fellow in the Department of Electrical and Computer Engineering at Hong Kong University of Science and Technology from Jun. 2008 to Feb. 2009. He received the B.Eng. (1st Class Honors) and M.Eng. from the National University of Singapore in 1998 and 2000 respectively, and the Ph.D. from The University of Texas at Austin, Austin, TX in 2008, all in electrical engineering. From 2000-2004, he was an associate scientist at the Institute for Infocomm Research (I2R) in Singapore. He frequently serves on the technical program committees of major IEEE conferences in wireless communications. Recently, he is the publicity co-chair of IEEE CTW 2011 and the area chairs of IEEE Asilomar 2011 and IEEE WCNC 2011. He is an editor for the Journal of Communication and Networks. Dr. Huang received an Outstanding Teaching Award from Yonsei, Motorola Partnerships in Research Grant, the University Continuing Fellowship at UT Austin, and the Best Student Paper award at IEEE GLOBECOM 2006. His research interests focus on multi-antenna limited feedback techniques and the analysis and design of wireless networks using stochastic geometry.

Organizer:

Prof. Ricky Kwok