



THE CHINESE UNIVERSITY OF HONG KONG
Institute of Network Coding
and
Department of Information Engineering
Seminar



Pilot Contamination Elimination Precoding in Multi-Cell Massive MIMO Systems

by

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Date : 23 April 2015 (Thursday)

Time : 11:00am – 12:00pm

**Venue: Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong**

Abstract

In this work, we consider the pilot contamination problem in multi-cell massive MIMO systems. We propose a novel cell-specific uplink training scheme along with a downlink pilot contamination elimination precoding (PCEP) scheme. In the uplink training phase, the users in one cell apply the same pilot sequence, while orthogonal pilot sequences are employed in different cells. With the time-division duplex operation, the base stations (BSs) estimate the downlink channels in the uplink training phase. For downlink data transmissions, the PCEP scheme is adopted prior to the downlink beamforming to cancel the intra-cell interference caused by the engineered pilot contamination. We show that the downlink received signal-to-interference-plus-noise ratios (SINRs) of all users approach infinity simultaneously as the number of BS antennas tends to infinity. We also investigate the performance of the cell-specific uplink training scheme and the PCEP scheme in the practical scenarios with finite number of BS antennas. Simulations are carried out to confirm the improvement in system performance of the proposed schemes in practical scenarios.

Biography

Binyue Liu received his BS degree in communications engineering (with first-class honors) from Xidian University, Xi'an, China, in July 2009. Then he was recommended for admission to the graduate school of Xidian University in September 2010. He began a joint master/PhD program under the supervision of Prof. Ning Cai from September 2011. He has been a visiting PhD student at the Institute of Network Coding, the Chinese University of Hong Kong, since October 2014. His research interests include cooperative communications, signal processing for multiple-input multiple-output systems, and analog network coding.

**** ALL ARE WELCOME ****