

Presents the Summer 2013 EECS Seminar Series

Dr. Yufeng Wang
Huawei Technology

“Opportunistic Relaying in Wireless Networks”
Friday, May 10, 2013 • 2:00 p.m. • HEC 450

The demand for ever larger, more efficient, reliable and cost effective communication networks necessitates new network architectures, such as wireless ad hoc networks, cognitive radio, relaying networks, femtocell, and wireless sensor networks. The study of such networks requires a fundamental shift from thinking of a network as a collection of independent communication pipes, to a multi-user channel where users cooperate via conferencing, relaying, and joint source-channel coding.

In this work, we first identify major challenges intrinsic to wireless ad hoc networks that affect the system performance, in terms of throughput, delay, fairness and stability. We then develop an opportunistic relaying and cooperative scheme to achieve the optimal system performance. We also prove two key inequalities that capture the various tradeoffs inherent in the broad class of opportunistic relaying protocols, illustrating that no scheduling and routing algorithms can simultaneously yield lower delay and higher throughput. The proposed methods and analyses can be extended and implemented to any practical decentralized networks, such as mobile ad hoc networks (MANET), aeronautical communication networks (ACN), wireless sensor networks (WSN), cognitive radio (CR) and smart grid networks, etc.

BIOGRAPHY

Dr. Yufeng Wang received his Ph.D. degree from University of South Florida, Tampa, FL, with an outstanding dissertation award, in December 2012, the Master of Science degree from Royal Institute of Technology, Stockholm, Sweden (also known as KTH) in August 2008, and the Bachelor of Science degree from Beijing Jiaotong University, Beijing, China in July 2006, all in electrical engineering. He was with NEC-Laboratories America in Princeton, NJ, as a research assistant from April to December, 2012. Since January 2013, he has been with wireless R&D lab of Huawei Technology as a research engineer, in Bridgewater, NJ.

His research focuses on information, communication and optimization theories with their applications in wireless and mobile ad hoc networks. Specifically, his research includes multiuser communication over fading channels, cooperative relaying, OFDM-MIMO techniques, heterogeneous networks, cognitive radio, femtocell networks, smart grid, 4G LTE-Advanced networks, and future wireless networks beyond 4G.