



Electrical and Computer Engineering Department Seminar

Achieving Secure Communication Over Wireless Channels

Yingbin Liang
Faculty Candidate
Princeton University
Department of Electrical Engineering

March 15, 2007, Thursday, 260DL 10:30am

Abstract: In this talk, I will begin with an overview of research in information theory for wireless communications, including a summary of my contributions to this area. The main focus of the talk will be on my recent work on information-theoretic security for wireless communication networks.

Two basic wireless communication scenarios are broadcast communication from one transmitter to multiple receivers and multiple access communication from multiple transmitters to one receiver. While security issues were addressed for broadcast communication by Wyner, Csiszar and Korner in 70's, security issues in multiple access communication have been open for three decades. In this talk, I will present our work towards resolving these open problems.

I will first introduce the channel that we have identified to model wireless multiple access communication, where security issues arise naturally. For this channel, we have developed novel techniques to characterize reliable communication rates under secrecy constraints (possibly perfect secrecy). I will also postulate the general coding design principles that are essential to achieve secure communication. The work is performed jointly with Prof. Vincent Poor at Princeton University and Prof. Shlomo Shamai at Technion, Israel.

Bio: Yingbin Liang received the Ph.D. degree in Electrical Engineering from the University of Illinois at Urbana-Champaign in 2005. Since September 2005, she has been working as a postdoctoral research associate at Princeton University. Her research interests include wireless communications and networks, information security, and information theory. Dr. Liang was a Vodafone Fellow at the University of Illinois at Urbana-Champaign during 2003-2005, and received the Vodafone-U.S. Foundation Fellows Initiative Research Merit Award in 2005. She also received the M. E. Van Valkenburg Graduate Research Award from the ECE department, University of Illinois at Urbana-Champaign, in 2005.

