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

Advances in Cross-Layer Wireless Design

by

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Date : **18 March, 2010 (Thursday)**
Time : **2:30 pm - 3:30 pm**
Venue : **Room 1009, William M.W. Mong Engineering Building**
The Chinese University of Hong Kong

Abstract
This talk advocates a cross-layer wireless design for dealing with interference. It shows that such an approach changes the way interference is perceived. Instead of viewing interference as an inherently counterproductive phenomenon, we show how to successfully reconstruct the transmitted information even in the presence of collisions, thereby rendering the interference harmless. Moreover, we show how to exploit interference constructively to increase the throughput.

Specifically, I will first present ZigZag decoding, which allows a receiver to decode collisions without any assumptions of sender synchronization, large differences in power, or special codes. In fact, our approach exploits the natural asynchrony between colliding transmitters. This asynchrony results in stretches of interference-free bits at the start of a collision, which we use to bootstrap our decoder. Our approach introduces no overhead when there are no collisions. But when senders collide the receiver successfully reconstructs the transmitted information, eliminating unnecessary retransmissions to attain the same throughput as if the packets did not collide at all.

Next, I will present Analog network coding (ANC) which encourages strategically picked senders to interfere. Instead of forwarding packets, routers forward the interfered signal. The destination leverages network-level information to cancel the interference and recover the transmitted signal. Both analytic and experimental results from a testbed show the benefits of this approach.

Biography
Dina Katabi is an Associate Professor in the Electrical Engineering and Computer Science Department at MIT. She has joined the MIT faculty in March 2003, after completed her PhD at MIT. Dina's work focuses on wireless networks, network security, routing, and distributed resource management. She has award winning papers in ACM SIGCOMM and Usenix NSDI. She has been awarded the IEEE William R. Bennett prize in 2009, a Sloan Fellowship in 2006, the NBX Career Development chair in 2006, and an NSF CAREER award in 2005. Her doctoral dissertation won an ACM Honorable Mention award and a Sprowls award for academic excellence.

** ALL ARE WELCOME **

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