Princeton University
Department of Electrical Engineering
Information Sciences and Systems (ISS) Seminar

Speaker: Mehul Motani, National University of Singapore
Date: Thursday, February 13, 2007
Time: 4:30pm
Room: B205 ~ Equad
Title: Cooperative Networking - From Logarithms to Algorithms

Abstract:
In the last 50 years or so, information theory has helped to characterize many fundamental limits of communication and has driven innovation at the physical layer. In the meantime, networking for wireline networks has matured but wireless networks have advanced in a somewhat ad-hoc manner. One of the main challenges is that nodes in wireless networks can interact and cooperate in complex ways, often blurring the line between physical and network layer functions. My research group aims to understand cooperative networking for wireless ad-hoc and sensor networks from two perspectives. On one hand, we use network information theory to help us understand the limits of communication and cooperation in networks, e.g., relay, multiple relay, and interference channels. On the other hand, we design algorithms and protocols for cooperative networking, e.g., for multichannel MAC, directional antennas and collaborative signal processing. Combining these two perspectives, we describe how information theory in a network setting can suggest efficient approaches to routing for cooperative relaying.

Biography:
Mehul Motani is currently an Assistant Professor in Electrical and Computer Engineering at the National University of Singapore. He graduated with a PhD from Cornell University, focusing on information theory and coding for CDMA systems. Prior to his PhD, he was a member of technical staff at Lockheed Martin in Syracuse, New York for over four years. Recently he has been working on research problems which sit at the boundary of information theory, communications and networking, including the design of wireless ad-hoc and sensor network systems. He was awarded the Intel Foundation Fellowship for work related to his PhD in 2000 and nominated for the Best Teacher award at NUS. He is on the organizing committees for ISIT 2006 & 2007 and has served on the technical program committees of MobiCom 2007 and many other conferences. He participates actively in IEEE & Sigmobile/ACM and has served as the secretary of the IEEE Information Theory Society Board of Governors.