

# Niranjay Ravindran

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## RESEARCH INTERESTS

Wireless Communications, Information Theory, Signal Processing

## EDUCATION

**PhD in Electrical Engineering** Sept 2007 - Present  
University of Minnesota, Twin Cities

**MS in Electrical Engineering** Sept 2005 - Present  
University of Minnesota, Twin Cities

**Bachelor of Engineering in Electronics & Communication** June 2001 - May 2005  
Anna University, Chennai, India  
Aggregate Percentage: 85%

## EXPERIENCE

- *Graduate Research Assistant* June 2006 - Present  
Department of Electrical and Computer Engineering  
University of Minnesota, Twin Cities  
*Research Area:* MIMO Communications with Limited Feedback  
Advisor: Prof. Nihar Jindal
- *Graduate Research Assistant* Sept 2005 - May 2006  
Laboratory for Computational Science and Engineering  
University of Minnesota, Twin Cities  
*Project:* Interactive software for a high-volume renderer  
Advisor: Prof. Paul Woodward

## SKILLS

- Programming languages: Highly proficient in C, C++, C# .net, VB
- Simulation & Analysis: Well versed in Matlab, Simulink, GloMoSim
- Others: ASP, SQL, PERL

## STANDARDIZED TEST SCORES

- Graduate Record Examination (GRE):  
Total 1480/1600, Quantitative 800/800, Verbal 680/800 Analytical Writing 5.0/6.0
- Test of English as a Foreign Language (TOEFL): 300/300 Essay: 6.0/6.0
- SPEAK Test (Test of Spoken English): 60/60

## CONFERENCE PUBLICATIONS

1. N. Ravindran, and N. Jindal, "Multi-User Diversity vs. Accurate Channel Feedback for MIMO Broadcast Channel", Submitted to: IEEE International Conference on Communications (ICC), September 2007
2. G. Caire, N. Jindal, M. Kobayashi, and N. Ravindran, "Achievable Throughput of MIMO Downlink Beamforming with Limited Channel Information", IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC), August 2007 (Invited Paper)
3. N. Ravindran, N. Jindal, and H. Huang, "Beamforming with Finite Rate Feedback for LOS MIMO Downlink Channels", IEEE Global Communications Conference (GLOBECOM), November 2007
4. G. Caire, N. Jindal, M. Kobayashi, and N. Ravindran, "Quantized vs. Analog Feedback for the MIMO Downlink: A Comparison between Zero-Forcing Based Achievable Rates", IEEE International Symposium on Information Theory (ISIT), June 2007
5. N. Ravindran and N. Jindal, "MIMO Broadcast Channels with Block Diagonalization and Finite Rate Feedback", IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), April 2007

## COURSE PROJECTS

- *Detection and Estimation* (April 2007):  
Worst-case capacity and (robust) power allocation for MIMO systems when channel estimates with a bounded error are available at the transmitter
- *Convex Optimization* (April 2006):  
Worst-case capacity and (robust) power allocation for MIMO systems when channel estimates with a bounded error are available at the transmitter
- *Wireless Communications* (April 2006):  
A study on the design and performance of space-time coding for MIMO systems
- *Error Control Coding* (April 2006):  
Implementation of encoders and decoders for BCH, RS and Turbo Codes (Berlekamp-Massey, Meggitt, Soft Viterbi and log-MAP decoders) in MATLAB
- *Digital Communications* (December 2005):  
A study on the design techniques and performance of Multi-tone FSK systems and their implicit frequency diversity characteristics in Rayleigh fading channels
- *Senior Undergraduate Projects* (May 2005):
  - Design & simulation of a robust hierarchical (two level) multicast routing protocol for wireless ad hoc networks, with the upper level operating at the application layer and the lower level based on the Differential Destination Multicast (DDM) method
  - Simulation and performance analysis of a Ad hoc On demand Distance Vector (AODV) routing protocol on a wireless ad hoc network simulator, modified to account for signal strength information made available at the routing layer

- *Junior Undergraduate Project* (May 2004):  
MATLAB implementation of adaptive noise cancellation algorithms with correlated signal leakage

## **COURSEWORK**

*Graduate:* Probability and stochastic processes, Digital communications, Wireless communications, Error control coding, Convex optimization, Information theory, Mathematical analysis, Detection and estimation theory, Game theory, VLSI-DSP systems

*Undergraduate (Relevant):* Digital signal processing, Adaptive filtering, Communication systems, Cellular mobile communications, Antennas, Electromagnetic waveguides, Computer networks, Control systems, Data structures, Analog and digital circuit design.