

NARAYAN B. MANDAYAM

HOME

5 Penny Ct.
East Brunswick, NJ 08816
Email: narayan@winlab.rutgers.edu
WeB: www.winlab.rutgers.edu/~narayan

OFFICE

WINLAB, Rutgers University
671 Rt. 1 South
North Brunswick, NJ 08902
Phone: (848)-932-0947

EDUCATION:

Ph. D in Electrical Engineering, May 1994
Rice University, Houston, Texas

M.S. in Electrical Engineering, May 1991
Rice University, Houston, Texas

B. Tech (Hons.) in Electrical Engineering, May 1989
Indian Institute of Technology, Kharagpur, India

EXPERIENCE:

Dept. of ECE, Rutgers University, Piscataway, New Jersey
Distinguished Professor, July 2014 - present

Peter D. Cherasia Endowed Faculty Scholar, June 2010 - June 2014

Professor, July 2003 - June 2014

Associate Professor, July 2001 - June 2003

Assistant Professor, July 1996 - June 2001

WINLAB, Dept. of ECE, Rutgers University, Piscataway, New Jersey
Interim Director, January 2001 - July 2001

Associate Director, December 1999 - present

Research Associate, Sep. 1994 - June 1996

Princeton University, Princeton, New Jersey
Faculty Fellow in Dept. of EE, Sep. 2002 - Dec. 2002

Indian Institute of Science, Bangalore, India
Visiting Faculty in Dept. of ECE, Jan. 2003 - Jun. 2003

AWARDS AND HONORS:

- Donald G. Fink Award from the IEEE (2014)
- *National Academies Keck Futures Initiative (NAKFI) Grant Award*, May, 2013
- Invitee to *National Academies Keck Futures Initiative (NAKFI) Informed Brain in a Digital World*, 2012 (one of 100 invitees in the U.S. selected by the National Academy of Engineering (NAE), National Academy of Sciences (NAS), and Institute of Medicine (IOM))
- Distinguished Lecturer of the IEEE (2012-15)
- Peter D. Cherasia Faculty Scholar Award (2010)
- Technical Program Co-Chair, WiOPT 2011
- Briefer to JASON (an elite advisory group to the U.S. government) study on Cognitive Radio Networks (2010)
- Fred W. Ellersick Prize from the IEEE Communications Society (2009)
- Fellow, IEEE for contributions to “wireless data transmission” (2009)
- Guest Editor, IEEE JSAC - Game Theory in Communications and Networking (2008)

- Guest Editor, IEEE JSAC - Spectrum Agile Cognitive Radio Networks (2007)
- Editor, IEEE Transactions on Wireless Communications, 2002-2005
- Outstanding Engineering Faculty Recognition, Rutgers University, 2000
- Associate Editor, IEEE Communications Letters, December 1999-2003
- Invitee to *Annual Symposium on Frontiers of Engineering*, National Academy of Engineering (NAE), 1999 (one of hundred engineers in the U.S. selected by the NAE)
- National Science Foundation (NSF) CAREER Award, 1998
- *Outstanding Branch Counselor and Advisor Award Nominee*, IEEE, 1998-99
- *William Marsh Rice Fellowship*, Rice University, 1989-1990
- *Institute Silver Medal*, Indian Institute of Technology (I.I.T.), Kharagpur, 1989 (Awarded to the graduating student with the highest G.P.A. in Electrical Engineering)
- *National Talent Search Scholarship* (1983-1989). Awarded by the National Council of Educational Research and Training, New Delhi, India

CURRENT RESEARCH INTERESTS:

- Prospect Theory in the Design of Wireless Networks
- Noncontiguous Spectrum Access and Software Defined Networks
- Green Techniques for Internet of Things
- Microeconomics of Information Centric Networks
- Modeling of Social Knowledge Creation
- Visual MIMO Networks and Computational Photography
- End-User Behavior and the Smart Grid

GRANTS:

1. "A Software Defined Framework for Opportunistic Networking and Spectrum Management" Office of Naval Research (ONR) Grant (\$1,000,000), January 2015; PI: Narayan Mandayam, co-PI: Ivan Seskar, S. Kompella (NRL)
2. "NeTS: End-User Behavior and Prospect Pricing in Wireless Data Networks" National Science Foundation (NSF) Grant No. Award No. 1421961 (\$500,000), October 2014; - PI: Narayan Mandayam, co-PI: Arnold Glass (Rutgers Psychology)
3. "NeTS: Transmit Only: Green Communication for Dense Wireless Systems" National Science Foundation (NSF) Grant No. Award No. 1423020 (\$498,000), October 2014; - PI: Yanyong Zhang, co-PI: Narayan Mandayam
4. "From Informed Human Brains to Society-Scale Silicon Brains: Uncovering the DNA of Social Knowledge" NAKFI Grant Award (\$ 50,000), May 2013, PI: Oded Nov, co-PI: Narayan Mandayam, Ofer Arazy
5. "NeTS: Visual MIMO Networks" National Science Foundation (NSF) Grant No. CNS-1065463 (\$ 685,000), April 2011; - PI: Marco Gruteser, co-PI: Narayan Mandayam, Kristin Dana
6. "Bandwidth Exchange: A Framework for Enhancing the Performance of Cognitive Radio Networks" Office of Naval Research (ONR) (\$ 300,000), Awarded to start in February 2011; - PI: Narayan Mandayam
7. "DEDI: A New Framework for the Practice of Wireless Network Coding" National Science Foundation (NSF) CIF Grant (\$ 427,000), September 2010; - PI: Narayan Mandayam
8. "MIAMI: Mobile Infrastructures for Advancing Military Information Technologies" US Army-TACOM-ARDEC (\$ 659,401), September 2009; - PI: Wade Trappe, co-PI: Narayan Mandayam, D. Raychaudhuri, I. Seskar
9. "RF Equipment Upgrades to Enable Scalable Crosslayer Protocol Experimentation on the ORBIT Radio Grid Testbed" Army Research Office (\$ 65,000), September 2008; - PI: Wade Trappe, co-PI: Narayan Mandayam
10. "NeTS-WN: A Joule for your Byte: Barter-Exchange Incentive Mechanisms for Wireless Networks" National Science Foundation (NSF) Grant No. CNS-0721826 (\$ 450,000), September 2007; - PI: Roy Yates, co-PI: Narayan Mandayam

11. "Cooperation and Conflict - Coalitional Games in Spectrum Sharing" National Science Foundation (NSF) Theoretical Foundations Grant, CCF-0634973(\$ 100,000), September 2006; - PI: Narayan Mandayam
12. "Fingerprints in the Ether - Exploiting the Radio Channel to Enhance Wireless Security" National Science Foundation (NSF) NeTS-ProWiN Grant (\$581,332), September 2006; - PI: Wade Trappe, co-PI: Narayan Mandayam, Larry Greenstein
13. "Cog-Net- An Experimental Protocol Stack for Cognitive Radio Networks and its Interaction with the Future Internet" National Science Foundation (NSF) NeTS-FIND Grant (\$450,000), September 2006; - PI: Dipankar Raychaudhuri, co-PI: Narayan Mandayam, Predrag Spasojevic
14. "NeTS-Cognitive Radios for Enabling Open Access to Spectrum" National Science Foundation (NSF) Grant No. NeTS-0434854 (\$ 670,000), September 2004; - PI: Narayan Mandayam, Co-PI : Chris Rose, Predrag Spasojevic, Roy Yates
15. "FMF-Unquantized and Uncoded Channel State Feedback in Multiple Antenna Multiuser Wireless Systems" National Science Foundation (NSF) Grant No. 0429724(\$ 200,000), September 2004; - PI: Narayan Mandayam
16. "Center for Multimodal Wireless Integrated Sensor-On-Silicon (MUSE) Technology" New Jersey Commission on Science and Technology (\$2,820,000) September 2002; - PI: Dipankar Raychaudhuri, Co-PIs : Yicheng Lu, Narayan Mandayam, John Li, Joseph Kedem
17. "Wireless Instructional Lab and Curriculum Development" Intel Corporation (\$ 240,000) September 2002; -PI: Narayan Mandayam, Co-PI : Dipankar Raychaudhuri, Badri Nath
18. "Achieving Innovative and Reliable Services in Unlicensed Spectrum" National Science Foundation (NSF) ITR Grant No. 0205362(\$ 886,411), September 2002; - PI: Roy Yates, Co-PI : Narayan Mandayam, Dipankar Raychaudhuri, Chris Rose, Predrag Spasojevic
19. "'Free Bits" : The Real Challenge of the Wireless Internet" National Science Foundation (NSF) ITR Grant No. 0085986 (\$ 860,000), September 2000; - PI: Roy Yates, Co-PI : Narayan Mandayam, Chris Rose
20. "CAREER: Radio Resource Management for Wireless Data Networks" National Science Foundation (NSF) Career Grant CCR-9874976 (\$ 200,001) September 1, 1999; - PI : Narayan Mandayam
21. "Media Access Control (MAC) Protocols for Wireless Multimedia CDMA Systems" Telcordia Technologies (\$ 10,000) September 1, 1999; -PI: Narayan Mandayam
22. "Performance Analysis of Interference Cancellation for WCDMA Systems in Multicell Environments" NTT DoCoMo, Japan (\$ 90,000) September 1, 1999; - PI: Roy Yates, Co-PI : Narayan Mandayam
23. "KDI: Multimodal Collaboration Across Wired and Wireless Networks" National Science Foundation (NSF) IIS-98-72995 (\$ 2,196,006) September 1, 1998; - PI: Jim Flanagan, Co-PIs : Narayan Mandayam, David Goodman, Casimir A. Kulikowski, Sven J. Dickinson, Ivan Marsic, Peter Meer, Manish Parashar
24. "Digital Radio as Enabling Technology for Computing, Communications and Information Systems" New Jersey Commission on Science and Technology (\$1,218,405) July 1998; - PI: Roy Yates, Co-PIs : Richard Frenkiel, Narayan Mandayam and Chris Rose
25. "Parallel Computing For Wireless Networking Research" National Science Foundation (NSF) NCR 97-29863 (\$ 170,000) November 1, 1997; - PI: David Goodman, Co-PIs : Narayan Mandayam, Andrew Ogielski, Christopher Rose and Roy Yates
26. "Capacity and Protocols for Integrated Voice/Data CDMA Systems" National Science Foundation (NSF) NCR 97-06036 (\$ 328,057) October 1, 1997; - PI : Narayan Mandayam
27. "Scalable Self-Organizing Simulations S3" DARPA ITO Order No. AOD 812, Contract No. N66001-96-C-8530 (Contract Issued by -: Naval Command Control and Ocean Surveillance Center (NCCOSC)) 1997-1999 (Rutgers Internal Grant (\$ 504,225) administered by Center for Discrete Mathematics and Theoretical Computer Science (DIMACS)) - PI : Narayan Mandayam, Co-PI: Roy Yates

28. "Subspace-based Approaches for Signal Quality Estimation and Interference Cancellation in Wireless Systems" Texas Instruments Inc. (\$ 33,500) September 1, 1997; - PI: Narayan Mandayam, Co-PI : Roy Yates
29. "Interference Cancellation Prototyping and ASIC Development for Wireless CDMA Communication" National Science Foundation (NSF), NSF IUCRC for Wireless Information Networks : TIE Program between University of California San Diego and The State University of New Jersey (\$50,000) August 15, 1997; Rutgers University (PI: Narayan Mandayam) UC San Diego (PI: Paul Chau)
30. "A Testbed for Multiuser Detection" Office of Naval Research (ONR) (\$ 119,000) January 1, 1997; PI : Narayan Mandayam
31. "Capacity and Protocols for Multimedia Wireless Systems" AT & T Foundation Grant, (\$ 23,400) January 1, 1997; PI : Narayan Mandayam, Co-PI: David Goodman

INVITED TALKS:

- "Game Theoretic Modeling of Online Knowledge Creation in Wikipedia", ITA Workshop, San Diego, CA, February 2015
- "Backhauling in TV White Space", New Jersey Advanced Communications Symposium, Hoboken, NJ September 2014
- "Towards Uncovering the DNA of Silicon Brains", SEEDS Seminar, University of Miami, Miami, FL, April 2014
- "Forces and Strategies that Shaped the Wireless Revolution", Bell Labs, Alcatel-Lucent, Bangalore, July 2013
- "Backhauling in TV White Spaces", IEEE Distinguished Lecture, Indian Institute of Science (IISc.), Bangalore, India, July 2013
- "When Users Interfere with Protocols - Prospect Theory in Wireless Networks", IEEE Communication Theory Workshop, Phuket, Thailand, June 2013
- "Towards Green Techniques for Wireless Networks", IEEE Distinguished Lecture, University of Technology, Kingston, Jamaica, May 2013
- "Network Coding as a Dynamical System", IEEE Distinguished Lecture, IEEE COMSOC, Orlando, FL, May 2013
- "Backhauling in TV White Spaces", IEEE Distinguished Lecture, Adtran Corp., Huntsville, AL, May 2013
- "Forces and Strategies that Shaped the Wireless Revolution", IEEE Distinguished Lecture, AT&T, Birmingham, AL, May 2013
- "Backhauling in TV White Spaces", IEEE Distinguished Lecture, Georgia Tech., Atlanta, GA, May 2013
- "Backhauling in TV White Spaces", IEEE Distinguished Lecture, IEEE COMSOC, Charleston, SC, May 2013
- "Backhauling in TV White Spaces", IEEE Distinguished Lecture, National Electronic Museum, Washington D.C., May 2013
- "Network Coding as a Dynamical System", IEEE Distinguished Lecture, Syracuse University, April 2013
- "Towards Green Techniques for Wireless Networks", IEEE Distinguished Lecture, Madras Institute of Technology Anna University-KBC, Chennai, India, October 2012
- "Network Coding as a Dynamical System", IEEE Distinguished Lecture, Indian Institute of Science (IISc.), Bangalore, India, September 2012
- "Network Coding as a Dynamical System", IEEE Distinguished Lecture, Indraprastha Institute of Information Technology (IIIT) Delhi, New Delhi, India, September 2012
- "Network Coding as a Dynamical System", IEEE Distinguished Lecture, Osmania University, Hyderabad, India, September 2012
- "Towards Green Techniques for Wireless Networks", IEEE Distinguished Lecture, HelloSoft Inc., Hyderabad, India, September 2012
- "Towards Green Techniques for Wireless Networks", IEEE Distinguished Lecture, AirTight Networks Inc., Pune, India, September 2012

- “Towards Green Techniques for Wireless Networks”, IEEE Distinguished Lecture, Institute of Electronics and Telecommunications Engineers (IETE), Pune, India, September 2012
- “Network Coding as a Dynamical System”, IEEE Distinguished Lecture, Pune University, Pune, India, September 2012
- “Towards Green Techniques for Wireless Networks”, IEEE Distinguished Lecture, Center for Development of Advanced Computing (C-DAC), Pune, India, September 2012
- “Enabling Cognitive Radio Networks”, IEEE Distinguished Lecture, Drexel University, Philadelphia, April 2012
- “Enabling Cognitive Radio Networks”, NSF Workshop on Beyond Cognitive Radio, University of Illinois, Urbana-Champaign, June 2011
- “Bandwidth Exchange: A Framework for Enhancing the Performance of Cognitive Radio Networks”, Naval Research Laboratories (NRL), Washington D.C., May 2011
- “Towards Green Techniques for Wireless”, Keynote Address at MedHocNet 2010, Juan-Les-Pins, France, June 2010
- “Resource Allocation in Cognitive Radio Networks”, JASON Study on Cognitive Radio Networks, San Diego, CA, June 2010
- “Communicating in TV White Space”, Panel Leader at IEEE Communication Theory Workshop, Cancun, Mexico, May 2010
- “Towards Green Wireless”, Panelist at IEEE Saranoff Symposium, Princeton, NJ, April 2010
- “Cognitive Radios in Wireless Ecosystems”, “Workshop on Views on Cognitive Radio: Key Issues and Long-term Development”, Huawei Technologies, San Diego, CA, April 2009
- “Coalitions and Incentives in Cognitive Radio Networks”, New York Metro Area Networking Workshop, Columbia University, New York, March 2009
- “Coexistence in Cognitive Radio Networks”, NSF Workshop on the Future of Cognitive Radio, Arlington, VA, March 2009
- “Coalitions and Incentives in Cognitive Radio Networks”, Center for Multimedia Communications Seminar, Rice University, Houston, TX, February 2009
- “Coalitions and Incentives in Cognitive Radio Networks”, ECE Colloquium, Indian Institute of Science (IISc.), Bangalore, India, October 2008
- “Coalitions and Incentives in Cognitive Radio Networks”, Illinois Center for Wireless Systems, University of Illinois @ Urbana-Champaign, IL, May 2008
- “Coalitions and Incentives in Cognitive Radio Networks”, Information Sciences and Systems Seminar, Princeton University, Princeton, NJ, May 2008
- “Cognitive Radio Networks”, Princeton ACM/IEEE Computer Society Lecture Series, Princeton, NJ, January 2008
- “Cognitive Radio Networks”, InterDigital Distinguished Lecture, King of Prussia, PA, January 2008
- “Cognitive Radio Networks”, IEEE Princeton/Central Jersey Communications and Consumer Electronics Lecture Series, Princeton NJ, December 2007
- “Cognitive Radio Networks”, Electrical Engineering Seminar, Columbia University, New York, September 2007
- “Cognitive Radio Networks”, National Science Foundation (NSF) Workshop on Bridging Physical Layer and Networking, Reston VA, August 2007
- “Cognitive Radio Networks”, DIMACS Tutorial on Algorithms for Next Generation Networks, Rutgers University, NJ, August 2007
- “Cognitive Radio Networks”, ECE Colloquium, Indian Institute of Science (IISc.), Bangalore, India, July 2007
- “Cognitive Radio Networks- Overview, Challenges and Directions”, Keynote Address at The Frequency Resource Development Symposium, Association of Radio Industries and Businesses, Tokyo, Japan, June 2007
- “Cognitive Radio Networks- Overview, Challenges and Directions”, National Institute of Information Technology (NICT), Yokosuka, Japan, June 2007
- “Cognitive Algorithms and Architectures for Open Access to Spectrum”, The Royal Institute of Technology (KTH), Stockholm, Sweden, April 2005
- “Cognitive Radios for Enabling Open Access to Spectrum”, National Science Foundation (NSF) Wireless Networking PI Meeting, Nashua, NH, October 2004
- “Freebits: The Real Challenge of the Wireless Internet”, Intel, Bangalore, India, June 2003

- “Freebits: The Real Challenge of the Wireless Internet”, IEEE Colloquim Series, Bangalore, India, May 2003
- “Freebits: The Real Challenge of the Wireless Internet”, Defense Research Development Organization (DRDO), Bangalore, India, May 2003
- “Radio Resource Management for Wireless Data”, Golden Jubilee ECE Colloquim, Indian Institute of Science, Bangalore, India, February 2003
- “Radio Resource Management for Wireless Data”, Drexel University, Philadelphia, PA January 2002
- “Radio Resource Management for Wireless Data”, University of California at Irvine, Irvine, July 2001
- “Free Bits: The Real Challenge of the Wireless Internet”, 3G and Beyond Technology Workshop, Nokia Research Center, Beijing, China, June 2001
- “Radio Resource Management for Wireless Data”, University of Texas at Dallas, Dallas, May 2001
- “Radio Resource Management for Wireless Data”, Southern Methodist University, Dallas, April 2001
- “Power Control for Wireless Data: Static and Dynamic Policies”, IEEE Vehicular Technology Society, North Jersey Chapter Seminar, October 24, 2000
- “Software Defined Radio Architectures for Interference Cancellation in CDMA Systems”, Morphics Technologies, Campbell, CA, October 13, 2000
- “Blind Interference Cancellation for CDMA Systems”, Motorola, Piscataway, NJ, September 21, 2000
- “Power Control for Wireless Data: Static and Dynamic Policies”, Crawford Hill Wireless Coffee Hour Seminar, Bell Labs, Lucent Technologies, August 24, 2000
- “Power Control for Wireless Data: Static and Dynamic Policies”, Polytechnic University, February 24, 2000
- “Power Control for Wireless Data: Games, Utility and Pricing”, Newman Springs Seminar, AT & T Research Labs, January 5, 2000
- “Power Control for Wireless Data: Games, Utility and Pricing”, Princeton University, October 28, 1999
- “Power Control for Wireless Data: Games, Utility and Pricing”, Columbia University, October 26, 1999
- “Software Defined Radio Architectures for Interference Cancellation in CDMA Systems”, University of California, San Diego, May 18, 1999
- “A New Framework for Radio Resource Management in Wireless Data Networks: Games, Utility and Pricing”, New Jersey Institute of Technology, Newark, April 19, 1999
- “Introduction to Spread Spectrum,” (Short Course) Wireless Symposium & Exhibition, Santa Clara, California, February 13, 1998
- “Wireless Staffing,” Wireless Engineering Roundtable Forum, International Engineering Consortium, Chicago, November 10, 1997
- “Capacity and Protocols for Integrated Voice/Data CDMA Systems,” Crawford Hill Wireless Coffee Hour Seminar, Bell Labs, Lucent Technologies, November 26, 1996
- “Wireless Simulation Scenarios,” DARPA PI Meeting (Scalable Self-Organizing Simulations S3 Project), Center for Discrete Mathematics & Theoretical Computer Science (DIMACS), Rutgers University, November 8, 1996
- “Capacity and Protocols for Integrated Voice/Data CDMA Systems,” Harvard University, April 24, 1996
- “Capacity and Protocols for Integrated Voice/Data CDMA Systems,” Cornell University, April 3, 1996
- “Capacity and Protocols for Integrated Voice/Data CDMA Systems,” University of Pennsylvania, March 17, 1996
- “Capacity and Protocols for Integrated Voice/Data CDMA Systems,” George Washington University, March 11, 1996
- “Capacity and Protocols for Integrated Voice/Data CDMA Systems,” UCLA, February 5, 1996

BOOKS:

- “Principles of Cognitive Radio” E. Biglieri, A. Goldsmith, L. J. Greenstein, N. B. Mandayam, and H. V. Poor, Cambridge University Press, 2012
- “Wireless Networks: Multiuser Detection in Cross-Layer Design” C. Comaniciu, N. B. Mandayam and H. V. Poor, Springer New York, 2005

BOOK CHAPTERS:

1. D. Zhang, N. B. Mandayam, “Incentivized Secondary Coexistence”, in *Mechanisms and Games for Dynamic Spectrum Allocation*, T. Alpcan, H. Boche, M. Honig, H. V. Poor (Eds.), Cambridge University Press UK, 2013
2. C. Raman, G. Foschini, R. Valenzuela, R. Yates and N. B. Mandayam, “Collaborative Relaying in Downlink Cellular Systems”, in *Cooperative Cellular Wireless Networks*, V. Bhargava, E. Hossain, D. I. Kim (Eds.), Cambridge University Press UK, 2010
3. L. Xiao, L. J. Greenstein, N. B. Mandayam, and W. Trappe, “Channel-Based Authentication”, in *Securing Wireless Communications at the Physical Layer*, W. Trappe and R. Liu, (Eds.), Springer-Verlag New York, 2009
4. C. Raman, J. Singh, R. D. Yates, N. B. Mandayam, “Scheduling in Cognitive Networks”, in *Cognitive Wireless Networks: Concepts, Methodologies and Visions inspiring the age of Enlightenment of Wireless Communications*, Frank H. P. Fitzek, Marcos D. Katz (Eds.), Springer, 2007.
5. D. Famolari, N. B. Mandayam, D. J. Goodman, V. Shah, “A New Framework for Power Control in Wireless Data Networks: Games, Utility and Pricing”, in *Wireless Multimedia Network Technologies*, pp. 289-310, Kluwer Academic Publishers, 1999
6. N.B. Mandayam, J. Holtzman, S. Barberis “Performance and Capacity of a Voice/Data CDMA System with Variable Bit Rate Sources,” in *Insights into Mobile Multimedia Communications*, pp. 537-550, Academic Press, 1998

PUBLICATIONS:

Journal Articles

1. L. Xiao, N. B. Mandayam, and H. V. Poor, “Prospect Theoretic Analysis of Energy Exchange Among Microgrids” in *IEEE Transactions on Smart Grid*, vol. 6, No. 1, pp. 63-72, January 2015
2. N. Krishnan, R. D. Yates, and N. B. Mandayam, “Uplink Linear Receivers for Multi-cell Multiuser MIMO with Pilot Contamination: Large System Analysis” in *IEEE Transactions on Wireless Communications*, vol. 13, No. 8, pp. 4360-4373, August 2014
3. T. Li and N. B. Mandayam, “When Users Interfere with Protocols: Prospect Theory in Wireless Networks using Random Access and Data Pricing as an Example,” in *IEEE Transactions on Wireless Communications*, 13(4):1888-1907, April 2014
4. T. Li, N. B. Mandayam, and A. Reznik, “A Framework for Distributed Resource Allocation and Admission Control in a Cognitive Digital Home” in *IEEE Transactions on Wireless Communications*, 12(3):984-995, March 2013
5. T. Nishio, R. Shinkuma, T. Takahashi, N. B. Mandayam, “TXOP Exchange: A Cooperation Mechanism for Wireless Access Networks,” in *IEICE Transactions on Communications*, vol. E95-B, no.6, pp.1944-1952, June 2012
6. D. Raychaudhuri and N. B. Mandayam, “Frontiers of Wireless and Mobile Communications,” in *Proceedings of the IEEE*, 100(4):824-840, April 2012 **This paper was awarded the 2014 IEEE Donald G. Fink Award**

7. N Krishnan, R. D. Yates, N. B. Mandayam, and J. S. Panchal, "Bandwidth Sharing for Relaying in Cellular Systems" in *IEEE Transactions on Wireless Communications*, 11(1):117-129, January 2012
8. D. Zhang and N. B. Mandayam, "Analyzing Random Network Coding with Differential Equations and Differential Inclusions," in *IEEE Transactions on Information Theory*, 57(12):7932-7949, December 2011
9. L. Sankar, G. Kramer, and N. B. Mandayam. "User vs. relay cooperation in time-duplexed multiaccess networks," *Journal of Communications*, vol. 6, no. 4, pp. 330-339, July 2011
10. C. Raman, G. J. Foschini, R. A. Valenzuela, R.D. Yates, and N. B. Mandayam, "Half-Duplex Relaying in Downlink Cellular Systems", in *IEEE Transactions on Wireless Communications*, vol.10, no.5, pp.1396-1404, May 2011
11. L. Sankar, Y. Liang, N. B. Mandayam, and H. V. Poor. "Opportunistic communications in fading Gaussian multiaccess relay channels," *IEEE Trans. Inform. Theory*, vol. 57, no. 4, pp. 1911-1931, April 2011
12. S. Mathur, A. Reznik, C. Ye, Y. Shah, W. Trappe, and N. B. Mandayam, "Exploiting the Physical Layer for Enhanced Security" in *IEEE Wireless Communications Magazine*, Special Issue on Security and Privacy, Vol. 17, No. 5, pp. 63-70, October 2010
13. D. Zhang, R. Shinkuma, and N. B. Mandayam, "Bandwidth Exchange: An Energy Conserving Incentive Mechanism for Cooperation" in *IEEE Transactions on Wireless Communications*, vol. 9, No. 6, pp. 2055-2065, June 2010
14. C. Ye, S. Mathur, A. Reznik, Y. Shah, W. Trappe, and N. B. Mandayam, "Information Theoretic Secret Key Generation for Fading Wireless Channels" in *IEEE Transactions on Information Forensics & Security*, vol. 5, No. 2, pp. 240-254, June 2010
15. C. Comaniciu, N. B. Mandayam, H. V. Poor, and J. Gorce, "An Auctioning Mechanism for Green Radio" in *Journal of Communication Networks*, vol. 12, No. 2, pp.114-121, April 2010
16. L. Xiao, L. Greenstein, N. Mandayam, and W. Trappe, "Channel-based spoofing detection in frequency-selective Rayleigh channels," in *IEEE Transactions on Wireless Communications*, vol. 8, No. 12, pp. 5948-5956, December 2009
17. H. Liu, L. Razoumov, N. B. Mandayam, and P. Spasojevic, "An Optimal Power Allocation Scheme for the STC Hybrid-ARQ over Energy Limited Networks" in *IEEE Transactions on Wireless Communications*, vol. 8, No. 12, pp. 5718-5722, December 2009
18. L. Sankar, N. B. Mandayam, and H. V. Poor, "On the Sum Capacity of Degraded Gaussian Multiple Access Relay Channels" in *IEEE Transactions on Information Theory*, vol. 55, No. 12, pp. 5394-5411, December 2009
19. L. Xiao, L. Greenstein, N. Mandayam, and W. Trappe, "Channel-based detection of Sybil attacks in wireless networks," in *IEEE Transactions on Information Forensics & Security*, vol. 4, No. 3, pp. 492-503, September, 2009
20. S. Mathur, L. Sankar, N. B. Mandayam, "Coalitions in Cooperative Wireless Networks" in *IEEE Journal on Selected Areas in Communications (JSAC)* vol. 26, No. 7, pp. 1104-1115, September 2008
21. L. Xiao, L. J. Greenstein, N. B. Mandayam, W. Trappe "Using the Physical Layer for Wireless Authentication in Time-Variant Channels" in *IEEE Transactions on Wireless Communications* vol. 7, No. 7, pp. 2571-2579, July 2008
22. L. Xiao, L. J. Greenstein, N. B. Mandayam, S. Periyalwar "Distributed measurements for estimating and updating cellular system performance" in *IEEE Transactions on Communications* vol. 56, No. 6, pp. 991-998, June 2008
23. O. Ileri, N. B. Mandayam, "Dynamic Spectrum Access Models: Toward an Engineering Perspective in the Spectrum Debate" in *IEEE Communications Magazine* vol. 46, No. 1, pp. 153-160, January 2008 **This paper was awarded the 2009 Fred W. Ellersick Prize by the IEEE Communications Society**

24. L. Xiao, L. Greenstein, N. B. Mandayam, "Sensor-Assisted Localization in Cellular Systems" in *IEEE Transactions on Wireless* vol. 6, No. 12, pp. 4244-4248, December 2007
25. L. Sankar, G. Kramer, N. B. Mandayam, "Offset Encoding for Multiple Access Relay Channels" in *IEEE Transactions on Information Theory* vol. 53, No. 10, pp. 3814-3821, October 2007
26. D. Samardzija, N. B. Mandayam "Impact of Pilot Design on Achievable Data Rates in Multiple Antenna Multiuser TDD Systems" in *IEEE Journal on Selected Areas in Communications (JSAC)* vol. 25, No. 7, pp. 1370-1379, September 2007
27. D. Samardzija, N. B. Mandayam "Uncoded and Unquantized Channel State Information Feedback in Multiple Antenna Multiuser Wireless Systems" in *IEEE Trans COM*, vol. 54, No. 7, pp. 1335-1345, July 2006
28. F. Meshkati, H. V. Poor, S. C. Schwartz, N. B. Mandayam "An Energy-Efficient Approach to Power Control and Receiver Design in Wireless Data Networks" in *IEEE Trans. on Communications*, vol. 53, No. 11, November 2005
29. D. Samardzija, N. B. Mandayam, D. Chizhik "Adaptive Transmitter Optimization in Multiuser Multiantenna Systems: Theoretical Limits, Effect of Delays and Performance Enhancements" in *EURASIP Journal on Wireless Communications and Networking*, Special Issue on Reconfigurable Radio for Future Generation Wireless Systems, Issue No. 3, 2005
30. S. Mau, N. Feng, N. B. Mandayam "Joint Network-Centric and User-Centric Radio Resource Management in a Multicell System" in *IEEE Trans. on Communications*, vol. 53, No. 7, pp. 1114-1118, July 2005
31. A. Domazetovic, L. Greenstein, N. Mandayam, I. Seskar "Propagation Models for Short-Range Wireless Channels with Predictable Path Geometries" *IEEE Trans. on Communications*, vol. 53, No. 7, pp. 1123-1126, July 2005
32. H. Wang, N. B. Mandayam "Opportunistic File Transfers over Fading Channels under Energy and Delay Constraints" in *IEEE Trans. on Communications*, vol. 53, No. 4, pp. 632-644, April 2005
33. J. Lai, N. B. Mandayam, "Performance of Turbo Coded WCDMA with Downlink Transmit Diversity in Correlated Fading Channels" in *IEEE Trans. on Wireless Communications*, vol. 4, No. 2, pp. 802-807, March 2005
34. O. Ilieri, S. Mau, N. B. Mandayam "Pricing for Enabling Forwarding in Self-Configuring Ad hoc Networks" in *IEEE JSAC*, vol. 23, No. 1, pp. 151-162, January 2005
35. S. Mau, N. Feng, N. B. Mandayam "Pricing and Power Control for Joint User-centric and Network-centric Resource Allocation" in *IEEE Trans. on Communications*, vol. 52, No. 9, pp. 1547-1557, September 2004
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95. D. Samardzija, N. B. Mandayam, I. Seskar "Blind Successive Interference Cancellation" in VTC'2000 (Fall), Boston, MA, September 2000
96. C. Saraydar, N. B. Mandayam, D. J. Goodman, "Multicell Pricing and Power Control in Wireless Data Networks" in VTC'2000 (Fall), Boston, MA, September 2000
97. C. Comaniciu, N. B. Mandayam, D. Famolari and P. Agrawal "Admission and Flow Control in Multimedia CDMA", in *Proceedings of IEEE Multimedia Conference*, New York, NY, July 2000
98. L. Song, N. B. Mandayam "Hierarchical SIR and Rate Control for the Downlink of CDMA Systems", in ICC'2000, New Orleans, L.A., June, 2000
99. H. Wang, N. B. Mandayam "Dynamic Utility Maximization for Mobile Data Communications under Delay Constraints" in VTC'2000 (Spring), Tokyo, Japan, May 2000
100. L. Song, N. B. Mandayam "Hierarchical SIR and Rate Control for CDMA Data Users", in CISS'2000, Princeton, NJ, March, 2000
101. D. Samardzija, N. B. Mandayam, I. Seskar "Blind Interference Cancellation for the CDMA Downlink" in CISS'2000, Princeton, NJ, March, 2000
102. D. J. Goodman, N. B. Mandayam, "Power Control for Wireless Data", To Appear in *Proceedings of IEEE International Workshop on Mobile Multimedia Communications Workshop MoMuC'99*, San Diego, November 15-17, 1999
103. S. Manji, G. Djuknic, N. B. Mandayam, "Variable Rate Channel Coding for Image Transmission using an Outage Criterion", in IEEE Wireless Communications and Networking Conference (WCNC'99), New Orleans, Louisiana, Sept. 21-24, 1999
104. C. Saraydar, N. B. Mandayam, D. J. Goodman, "Pareto Efficiency of Pricing based Power Control in Wireless Data Networks" in IEEE Wireless Communications and Networking Conference (WCNC'99), New Orleans, Louisiana, Sept. 21-24, 1999
105. L. Song, N. B. Mandayam, Z. Gajic "Analysis of an Up/Down Power Control Algorithm in CDMA Reverse Link under Fading Condition", in *Proceedings of 37th Annual Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September, 1999
106. C. Comaniciu, N. B. Mandayam, "Prediction based Access Control in Integrated Voice/Data CDMA Systems", in *Proceedings of IEEE ICC'99*, pp. 1447-1451, Vancouver, British Columbia, June 1999
107. C. Comaniciu, N. B. Mandayam, "Analysis of a Prediction based Access Control Mechanism for Short Message Data Service in an Integrated Voice/Data CDMA System", in *Proceedings of IEEE VTC'99*, pp. 128-132, Houston, TX, May 1999
108. K. Medapalli, N. B. Mandayam, "Combined Equalization and Cochannel Interference Cancellation for the Downlink using Tentative Decisions" in *Proceedings of IEEE VTC'99*, pp. 637-641, Houston, TX, May 1999
109. Z. Lei, D. J. Goodman, N. B. Mandayam, "Location Dependent Other-Cell Interference and Its Effect on the Uplink Capacity of a Cellular CDMA System" in *Proceedings of IEEE VTC'99*, pp. 2164-2168, Houston, TX, May 1999
110. Z. Lei, C. Saraydar, N. B. Mandayam, "Dynamic Paging Area Design by Interval Estimation", in the 2nd IEEE Signal Processing Workshop on Signal Processing Advances in Wireless Communications, Annapolis, MD, May, 1999
111. N. Feng, N. B. Mandayam, D. J. Goodman, "Joint Power and Rate Optimization for Wireless Data Services Based on Utility Functions", in *Proceedings of Conference on Information Sciences and Systems, CISS'99*, pp.109-114, The Johns Hopkins University, Baltimore, MD, March 1999

112. J. Lai , N. B. Mandayam, “Performance of Reed-Solomon Codes for Hybrid-ARQ over Rayleigh Fading Channels under Imperfect Interleaving”, in *Proceedings of Conference on Information Sciences and Systems, CISS'99*, The Johns Hopkins University, Baltimore, MD, March 1999
113. L. Song, N. B. Mandayam, Z. Gajic “Analysis of an Up/Down Power Control Algorithm for the CDMA Reverse Link: A Nonlinear Control Systems Approach”, in *Proceedings of Conference on Information Sciences and Systems, CISS'99*, pp. 119-124, The Johns Hopkins University, Baltimore, MD, March 1999
114. D. Famolari, N. B. Mandayam, D. J. Goodman, “A New Framework for Power Control in Wireless Data Networks: Games, Utility and Pricing”, *Proceedings of 36th Annual Allerton Conference on Communication, Control, and Computing*, pp. 546-555, Allerton, IL, September, 1998
115. V. Shah, N.B. Mandayam, D.J. Goodman, “Power Control for Wireless Data based on Utility and Pricing”, *Proceedings of PIMRC 1998*, pp. 1427-1432, Boston, September 1998
116. J. Panchal, O. E. Kelly, J. Lai, N. B. Mandayam, A. T. Ogielski, R. D. Yates, “ Scalable Parallel Simulations of Wireless Networks with WiPPET: Modeling of Radio Propagation, Mobility and Protocols” *Proceedings of MASCOTS 1998*, Montreal, July 1998
117. I. Seskar, N.B. Mandayam “Reconfigurable Testbed for Linear Multiuser Detection”, in *Proceedings of International Conference on Telecommunications (ICT'98)*, Chalkidiki, Greece, June, 1998
118. J. Panchal, O. E. Kelly, J. Lai, N. B. Mandayam, A. T. Ogielski, R. D. Yates, “ WiPPET, A Virtual Testbed for Parallel Simulations of Wireless Networks”, in *SIGSIM, IEEE-TCSIM, SCS Parallel and Distributed Simulation (PADS'98)*, pp. 162-169, Banff, Canada, May 1998.
119. S. Manji, N.B. Mandayam “Outage Probability for a Zero Forcing Multiuser Detector with Random Signature Sequences” in *Proceedings of IEEE VTC'98*, vol. 1, pp. 174-178, Ottawa, Canada, May, 1998
120. J. Lai, N.B. Mandayam “Packet Error Rate for Burst-Error-Correcting Codes in Rayleigh Fading Channels” in *Proceedings of IEEE VTC'98*, vol. 2, pp. 1568-1572, Ottawa, Canada, May, 1998
121. J. Borras, P. Hatrack, N.B. Mandayam “A Decision Theoretic Framework for NLOS Identification” in *Proceedings of IEEE VTC'98*, vol. 2, pp. 1583-1587, Ottawa, Canada, May, 1998
122. L. Song, N.B. Mandayam “A QoS Based Adaptive Power Control Algorithm for the CDMA Forward Link”, in *Proceedings of Conference on Information Sciences and Systems (CISS'98)*, vol. 1, p. 180, Princeton University, Princeton, NJ, March 1998
123. I. Seskar, N.B. Mandayam “A Software Radio Architecture for Linear Multiuser Detection”, in *Proceedings of Conference on Information Sciences and Systems (CISS'98)*, vol. 1, pp. 242-247, Princeton University, Princeton, NJ, March 1998
124. J. Lai, N.B. Mandayam “Fade Margins for Minimum Duration Outages in Log-Normal Shadow Fading and Rayleigh Fading” in *Proceedings of Asilomar*, pp. 609-613, Monterrey, CA, November, 1997
125. D. Ramakrishna, N.B. Mandayam, R. Yates “SIR Estimation in CDMA Cellular Systems using Subspace Tracking,” in *Proceedings of Asilomar*, pp. 149-153, Monterrey, CA, November, 1997
126. N.B. Mandayam, J. Holtzman “Effect of Tracking Errors on the Coding-Spreading Tradeoff in CDMA Systems” in *Proceedings of ICUPC'97*, vol. 2, pp.366-370, San Diego, CA, October 1997
127. J. Lai, N.B. Mandayam “Minimum Duration Outage for a Cellular System with Rayleigh Fading” in *Proceedings of Conference on Information Sciences and Systems (CISS'97)*, pp. 281-286, The Johns Hopkins University, Baltimore, MD, March 1997

128. A. Sampath, N. B. Mandayam, J. Holtzman "Erlang Capacity of an Integrated Voice/Data CDMA System with Optimal Power Control" in *Proceedings of IEEE VTC'97*, vol. 3, pp. 1557-1561, Phoenix, AZ, May 1997
129. D. Ramakrishna, N.B. Mandayam, R. Yates "Subspace-based Estimation of the Signal-to-Interference Ratio for CDMA Cellular Systems" in *Proceedings of IEEE VTC'97*, vol. 2, pp. 735-739, Phoenix, AZ, May 1997
130. D.J. Goodman, J. Borras, N.B. Mandayam, R. Yates "INFOSTATIONS : A New System Model for Data and Messaging Services" in *Proceedings of IEEE VTC'97*, vol. 2, pp. 969-973, Phoenix, AZ, May 1997
131. D. Ramakrishna, N.B. Mandayam, R. Yates "Subspace based Techniques for Estimation of the Signal-to-Interference Ratio in CDMA Cellular Systems" in *Symposium on Interference Rejection and Signal Separation in Wireless Communications (IRSS'97)*, George Washington University, Washington D.C., March 18, 1997
132. N.B. Mandayam, J. Holtzman "Coding-Spreading Tradeoff in CDMA Systems with Tracking Errors" in *Proceedings of Conference on Information Sciences and Systems (CISS'97)*, pp. 954-959, The Johns Hopkins University, Baltimore, MD, March 1997
133. M. Saquib, R. Yates, N.B. Mandayam "Decision Feedback Decorrelating Detector for a Dual Rate Synchronous DS/CDMA Channel," in *Proceedings of IEEE GLOBECOM'96*, vol. 3, pp. 1804-1808, London, U.K., November, 1996
134. N.B. Mandayam, P.C. Chen, J. Holtzman "Time Dependent Outages in Cellular Systems : Minimum Duration Outages," in *Proceedings of the 34th Annual Allerton Conference on Communication, Control, and Computing*, pp. 835-844, Allerton, IL, October, 1996
135. P.C. Chen, N.B. Mandayam, J. Holtzman "Minimum Duration Outages for Cellular Systems with Reception Diversity", in *Proceedings of IEEE ICUPC'96*, vol. 1, pp. 245-249, Cambridge, September, 1996
136. A. Sampath, N.B. Mandayam, J. Holtzman "Analysis of an Access Control Mechanism for Data Traffic in an Integrated Voice/Data CDMA System," in *Proceedings of IEEE VTC'96*, vol. 3, pp. 1448-1452, Atlanta, May, 1996
137. N.B. Mandayam, P.C. Chen, J. Holtzman "Minimum Duration Outages for Cellular Systems : A Level Crossing Analysis", in *Proceedings of IEEE VTC'96*, vol. 2, pp. 879-883, Atlanta, May, 1996
138. M. Saquib, R. Yates, N.B. Mandayam "Decorrelating Detectors for a Dual Rate Synchronous DS/CDMA System," in *Proceedings of IEEE VTC'96*, vol. 1, pp. 377-381, Atlanta, May, 1996
139. M. Andersin, N.B. Mandayam, R. Yates "Subspace based SIR Estimation for Cellular Systems," in *Proceedings of IEEE VTC'96*, vol. 2, pp. 1155-1159, Atlanta, May 1996
140. A. Sampath, N.B. Mandayam, J. Holtzman "A Simple Model for Admission of Short Message Data in an Integrated Voice/Data CDMA System," *Proceedings of INFORMS (Operations Research Society of America)*, Washington D.C., May, 1996
141. N.B. Mandayam, J. Holtzman "Analysis of a Simple Protocol for Short Message Data Service in an Integrated Voice/Data CDMA System," *Proceedings of MILCOM, 1995*, vol. 3, pp. 1160-1164, San Diego, November, 1995
142. N.B. Mandayam, S. Verdú "Analysis of an Approximate Decorrelating Detector for CDMA Systems," *Proceedings of the 33rd Annual Allerton Conference on Communication, Control, and Computing*, pp. 1043-1052, Allerton, IL, October, 1995
143. N.B. Mandayam "Adaptive Interference Suppression for DS-CDMA with Impulsive Noise" *Proceedings of IEEE International Symposium on Information Theory*, p. 26, Whistler, B.C., September 1995
144. N.B. Mandayam, J. Holtzman, S. Barberis "Erlang Capacity of an Integrated Voice/Data Wireless CDMA System with Variable Bit Rate Sources," *Proceedings of PIMRC 1995*, vol. 3, pp. 1078-1082, Toronto, September 1995

145. N.B. Mandayam “Adaptive Linear Detection for DS-CDMA Communications in Impulsive Channels”, *Proceedings of IEEE International Conference on Vehicular Technology (VTC)*, pp. 699-703, Chicago, IL, June 1995
146. N.B. Mandayam, J. Holtzman, and S. Barberis “Performance and Capacity of an Integrated Voice/Data Wireless CDMA System with Variable Bit Rate Sources,” *Proceedings of International Workshop on Mobile Multimedia Communications MoMuc-2, 1995*, Bristol, U.K., April 1995
147. N.B. Mandayam, B. Aazhang, “ An Adaptive Multiuser Interference Rejection Algorithm for DS-CDMA Systems”, *Proceedings of IEEE International Symposium on Information Theory*, p. 135, Trondheim, Norway, June 1994
148. N.B. Mandayam, B. Aazhang, “ An Adaptive Single-User Detector for Optical Code Division Multiple Access Systems”, in *Proceedings of the 28th Annual Conference on Information Sciences and Systems (CISS'94)*, pp. 485-490, Princeton University, Princeton, March 1994
149. N.B. Mandayam, B. Aazhang, “Generalized Sensitivity Analysis of Optical Code Division Multiple Access Systems”, in *Proceedings of the 27th Annual Conference on Information Sciences and Systems (CISS'93)*, pp. 302-307, The Johns Hopkins University, Baltimore, MD, March 1993.
150. N.B. Mandayam, B. Aazhang, “Error Probabilities for Fiber-Optic Code Division Multiple Access System”, in *Proceedings of the International Symposium on Information Theory*, p. 43, San Antonio, TX, Jan 1993.
151. N.B. Mandayam, B. Aazhang, “Importance Sampling Simulation of Single User and Multi User Optical Communication Systems”, in *Proceedings of the 25th Annual Conference on Information Sciences and Systems (CISS'91)*, pp. 822-827, The Johns Hopkins University, Baltimore, MD, March 1991.
152. N.B. Mandayam, G.P. Rao, A. Patra, S. Mukhopadhyay, B. Chakravarty, “Real-Time Parameter Estimation via Block Pulse Functions”, In *28th Annual Conference of the Society of Instrument and Control Engineers (SICE)*, Matsuyama, Japan, July 1989.

POSTDOCTORAL ADVISEES:

- Paschalis Ligdas, Ph.D. University of Maryland, 1997
- Siun-Chuon Mau, Ph.D. Princeton University, 2000

PAST ADVISEES:

- Ph.D. Students :
 1. Wenjia Yuan, Ph.D. September 2014, Thesis: “Computational Photography Methods for Visual MIMO” (currently at Google) (Co-advisors: K. Dana and M. Gruteser)
 2. Muhammad Nazmul Islam, Ph.D. September 2014, Thesis: “Noncontiguous Spectrum Access and Small Cell Network Design” (currently at Qualcomm)
 3. Ashwin Ashok, Ph.D. June 2014, Thesis: “Design, Modeling and Analysis of Visual MIMO Communication” (currently at CMU) (Co-advisor: M. Gruteser)
 4. Narayanan Krishnan, Ph.D. September 2013, Thesis: “Bandwidth Sharing and Massive MIMO for Next Generation Cellular Systems” (currently at Qualcomm) (Co-advisor: R. Yates)
 5. Tianming Li, Ph.D. September 2013, Thesis: “Cognitive Radio Networks: Resource Allocation and Effect of End-User Behavior” (currently at J. P. Morgan)
 6. Dan Zhang, Ph.D. September 2012, Thesis: “On the Dynamics of Random Network Coding” (currently at Qualcomm)

7. Suhas Mathur, Ph.D. July 2010, Thesis: "Building Information-Theoretic Confidentiality and Traffic Privacy into Wireless Networks" (currently at AT&T), (Co-advisors: W. Trappe and L. Greenstein)
 8. Chandrasekharan Raman, Ph.D. February 2010, Thesis: "Relaying and Scheduling in Interference Limited Wireless Networks" (currently at Alcatel-Lucent), (Co-advisors: R. Yates and G. Foschini)
 9. Liang Xiao, Ph.D. March 2009, Thesis: "PHY-Techniques to Improve Higher-Layer Functions in Wireless Networks" (currently Associate Professor at Xiamen University), (Co-advisors: W. Trappe and L. Greenstein)
 10. Zhuyu Lei, Ph.D. December 2008, Thesis: "Utility-based Power Control for Packet-Switched Wireless Networks" (currently at Alcatel-Lucent, IL)
 11. Hongbo Liu, Ph.D. November 2007, Thesis: "Cross-layer Design for Reliable and Efficient Data Transmission over Multiple Antenna Mobile Infostation Networks" (currently at Spirent, NJ)
 12. Omer Ileri, Ph.D. June 2007, Thesis: "Dynamic Spectrum Access Models: Towards an Engineering Perspective in the Spectrum Debate" (currently at Royal Institute of Technology (KTH))
 13. Lalitha Sankaranarayanan, Ph.D. May 2007, Thesis: "Relay Cooperation in Multiaccess Networks" (currently Assistant Professor at Arizona State University, was a post-doc at Princeton University)
 14. Hitesh Nama, Ph.D. February 2007, Thesis: "Resource Allocation in Cooperative and Non-cooperative Energy-constrained Wireless Networks" (currently at Marvel Semiconductor)
 15. Salim Manji, Ph.D. September 2004, Thesis: "Rate Adaptation Strategies for Progressive Image Transmission over Fading Channels" (currently at Spirent Technologies, NJ)
 16. Nan Feng, Ph.D. July 2004, Thesis: "User Centric and Network Centric Radio Resource Management" (currently at Alcatel-Lucent Technologies, NJ)
 17. Dragan Samardzija, Ph.D. April 2004, Thesis: "Multiple Antenna Wireless Systems and Channel State Information" (currently at Bell Labs, Alcatel-Lucent Technologies, NJ)
 18. Heng Wang, Ph.D. December 2002, Thesis: "Opportunistic Transmission for Wireless Data over Fading Channels under Energy and Delay Constraints" (currently at Qualcomm)
 19. Cristina Comaniciu, Ph.D., December 2001, Thesis: "Integrated Access Control and Detection for QoS in Multimedia CDMA Networks" (currently Associate Professor at Stevens Institute of Technology; was post-doc at Princeton University)
 20. Jie Lai, Ph.D., August 2001, Thesis: "Performance of Channel Coding on Temporally and Spatially Correlated Wireless Channels" (currently at Broadcom Inc.)
 21. Lei Song, Ph.D., August 2001, Thesis: "Resource Allocation Based on Hierarchical and Nonlinear Control in Wireless Networks" (currently at UTStar Telecom Inc.)
 22. Cem Saraydar, Ph.D., December 2000, Thesis: "Pricing and Power Control in Wireless Data Networks" (currently at GM Research)
- M.S. Students :
 1. Cyrus Gerami, M.S. May 2011, Thesis: "Spatio-Spectral Mapping of TV White Space in NJ"
 2. Tejaswy Hari, M.S. October 2009, Thesis: "Implementation of an Adaptive MIMO-OFDM Cognitive Radio"
 3. Suhas Mathur, M. S. October 2006, Thesis: "Coalitional Games in Cooperative Networks" (currently pursuing Ph.D. at Rutgers)
 4. Omer Ileri, M. S. October 2003, Thesis: "Pricing for Enabling Forwarding in Wireless Adhoc Networks"

5. Shrenik Patel, M.S., December 2002, Thesis: “Comparative Evaluation of OFDM and Single-Carrier Equalization Schemes for Infostation Channels” (currently at Time Domain Inc.)
6. Andrej Domazetovic, M.S., September 2002, Thesis: “Propagation Models for Short-Range Wireless Channels with Predictable Path Geometries” (currently at Ibiqity Digital)
7. Shaily Verma, M.S., July 2001, Thesis: “QoS Provisioning for Mobile Internet Access via GPRS/EDGE” (currently at Thomson Electronics)
8. Dragan Samardzija, M.S., June 2000, Thesis: “Blind Interference Cancellation Schemes for DS-CDMA Systems” (currently at Lucent Technologies)
9. Nan Feng, M.S., June 1999, Thesis: “Joint Power and Rate Optimization for Utility Maximization in Wireless Data Networks”, (currently pursuing Ph.D. at Rutgers)
10. Kamesh Medapalli, M.S., December 1998, Thesis: “TDMA Interference Cancellation and Equalization using Tentative Decisions” (currently at Stanford University)
11. Viral Shah, M.S., March 1998, Thesis: “Power Control for Wireless Data Services based on Utility and Pricing” (currently at Qualcomm, Inc.)
12. Deepa Ramakrishna, M.S., June 1997, Thesis: “Subspace Based Estimation of the Signal to Interference Ratio for CDMA Cellular Systems”

CURRENT ADVISEES:

- Ph.D. & M.S. Students :
 1. Kai Su, Ph.D. Thesis: Network Coding in Mobility First
 2. Ratnesh Kumbhkar, Ph.D. Thesis: SDN based Noncontiguous Spectrum Access
 3. Mohammad Hajimirsadeghi, Ph.D. Thesis: Microeconomic Design of Information Centric Networks
 4. Leonard Park, Ph.D. Thesis: Prospect Theory and Data Pricing in Wireless Networks
 5. Sudhir Pattar, Ph.D. Thesis: Broadcast Broadband Convergence
 6. Tejashri Kuber, Ph.D. Thesis: SDR Implementation of Noncontiguous Spectrum Sharing

THESIS COMMITTEES SERVED ON:

1. Ph.D. Committees: Ashwin Sampath, Mohammad Saquib, Fangchen Chen, Sennur Ulukus, Sudhir Ramakrishna, Pi-chun Chen, Joan Borrás, Wei Ma, Jun Li, Aylín Yener, Analucia Iacono, Liang Cheng, Xin Tang (NJIT), Dimitri Popescu, Rajnish Sinha, Otilia Popescu, Javier Gomez-Castellanos (Columbia U), Shalinee Kishore (Princeton U), Magnus Lindstrom (KTH, Sweden), Kemal Karakayali, Jasvinder Singh, Suli Zhao, Rahul Puppala, Xiangpeng Jing, Joydeep Acharya, Zang Li, Song Liu
2. M.S. Committees: Vikram Kaul, Ivana Maric, Sorabh Gupta, Paul Hatrack, Mark Wehle, Shubh Agarwal, Ivan Seskar, Jignesh Panchal, David Famolari, David Pandian, Jin Wang, Hua Mao, David Tabora, Nanyan Jiang, Kemal Karakayali, Kinjal Shah, Pavan Kaivaram, Neville Celemnis, Shanmuga Sundaram Anandaraman

UNDERGRADUATE RESEARCH INITIATIVES:

1. “Tracking Rutgers Students for Traffic Optimization,” Spring 2015. In this project, students are designing a module that will use the Cisco CMX API to gather data, process it into useful metrics, and present it in a fashionable form to optimize transportation traffic across the Rutgers campuses. (Students: Jason Scatena, Dan Su, Samin Rahman, Peter Zhang)

2. "Resonance based Wireless Power Transfer." Fall 2013. In this project, students designed a prototype device for remotely charging cell phones. (Students: Hiren Patel, Parth Patel, Nikunj Shah)
3. "Spectrum Sensing using GNU Radios" Fall 2006 and Spring 2007. In this project we use the GNU software defined radio toolkit to design a spectrum sensor which can sniff the spectrum of interest and identify transmitting devices (Student: Janani Kalyanam)
4. "Electrical Engineering Building WiFi Measurements & Analysis", Spring 2007. A group of 6 undergraduate students conducting measurements, modeling and prediction of WiFi signal coverage in the EE building on Busch Campus at Rutgers University (Students: Rodney Gataeu, Daniel Austin, Francois M. Jean-Noel, Nandita Mitra, Shil Madiwala, Michael Kasper)
5. "Wireless Networking Effects in Multistory Buildings using NetStumbler", Spring 2007. A group of 7 undergraduate students conducting measurements, modeling and prediction of WiFi signal coverage in the coRe building on Busch Campus at Rutgers University (Students: Sunny Balwani, Tanya Busayadilok, Niharika Gajawelli, Janani Kalyanam, Rohan Panjwani, Priti Shah, Jerry Yick)
6. "Busch Campus Center WiFi Measurements & Analysis" Spring 2006. A group of 4 undergraduate students conducting measurements, modeling and prediction of WiFi signal coverage in the Busch Campus Center at Rutgers University (Students: Suhridd Bhatt, Smeet Modi, Jigar Pathak, Lakshmi Murthy)
7. "Implementation of a Blind Successive Interference Canceller for CDMA" Spring 2002. A group of 3 undergraduate students built an SPW system emulation for blindly cancelling CDMA encoded interference from CDMA encoded voice transmissions (Students : Ahmad Turk, John Youssuf, Pranav Amin)
8. "Simulations of Coding Spreading Tradeoffs in CDMA Systems" Fall 1999 and Spring 2000. One undergraduate student (Siamak Sorooshiyari) worked on SPW simulations for understanding partitioning of bandwidth expansion in CDMA systems between channel coding and bandwidth spreading.
9. "Analysis and Design of an Infostation Testbed" (with Dr. I. Marsic): Fall 1999. A group of 7 undergraduate students building an infostation testbed including GUI and a rotating directional antenna to emulate drive-through and walk-through environments in an infostation setting (Students : Milton Cobo, Paul DiBenedetto, Phil Futernik, Michael Girone, Ulysses Gonzalez, Louis Lagonik, Nitish Sinha)
10. "Using Ad-Hoc Networks in Crisis Management" (with Dr. D. Goodman and Dr. I. Marsic): Spring 1999. A group of 15 undergraduate students built a demo including GUI and network support that facilitates multimodal collaboration across wired and wireless links in case of FIRE emergencies. (Students :S. Ali, E. Chen, O. Lewis, D. Mulato, M. Patel, A. Ogunshola, L. Rivera, A. Rowan, R. Sekhar, M. Shah, N. Shakir, D. Tabora, J. Tunis, K. Vapiwala, J. Vora)
11. "WCT: Wireless Collaborative Teleconferencing" (with Dr. D. Goodman): Fall 1998. A group of 13 undergraduate students worked on the creation of a concept that facilitates multimodal collaboration across wired and wireless links in case of FIRE emergencies. (Students :S. Ali, S. Chowdhury, C. Larson, G. Mittal, A. Ogunshola, T. Osinubi, L. Rivera, A. Rowan, R. Sekhar, N. Shakir, D. Tabora, J. Tunis, T. Zacharia)
12. "WISP-II: Wireless Internet Special Problems - Part II" (with Dr. D. Goodman): Spring 1998. A group of 10 undergraduate students worked on a prototype of the device "NaviDator" that provided location based mobile services including emergency and yellow page information. (Students: M. Anguin, A. Haidri, T. Holman, J. Ken-Kwofie, D. Ngo, A. Srivastava, R. Sharma, A. Tiwari, M. Vachharajani, A. Whittaker)
13. "WISP: Wireless Internet Special Problems" (with Dr. D. Goodman): Fall 1997. A group of 15 undergraduate students worked on the creation of a concept device called "NaviDator" that provided location based mobile services including emergency and yellow page information. (Students : M. Anguin, P. Boutros, M. Canuel, S. Ercilasun, A. Haidri, K. Harris, S. Ke, J.

Ken-Kwofie, D. Ngo, A. Srivastava, R. Sharma, S. Tamhankar, A. Tiwari, M. Vachharajani, A. Whittaker)

14. "Bayesian Decision making in an AlterEgo server" : Spring 1997. Testing decision rules for message forwarding to mobile hosts in Email management servers (Student: Stephan Samuel)

UNDERGRADUATE CO-OP PROGRAM ADVISING:

1. Christopher Shin, Verizon Wireless (Jun-Dec 2001)
2. Swarna Gadiraju, Motorola (Aug-Dec 2001)

NEW COURSES

1. "Forces and Strategies that Shaped the Wireless Revolution" (14:332:301) (introduced in Fall 2008) This multidisciplinary course is intended for all undergraduate students (from engineering, science, arts, business, economics, and humanities) who have an interest in the strategic problems that emerge when companies and entrepreneurs set out to create successful new businesses. A primary objective of the course is to demonstrate (using wireless communications systems as an illustrative example) that students from all disciplines can understand a wide range of strategic issues at a basic, intuitive level, and can use this basic understanding to solve important real-world problems.
2. "Wireless Instructional System Design" (introduced in Spring 2004): This instructional "hands-on" design course covers PHY, MAC, Networking and Application layers of wireless systems
3. "Wireless Communications Technologies" (introduced in Spring 1999): This course has since been adopted permanently into the graduate curriculum of the Department of Electrical & Computer Engineering, Rutgers University (Course No. 16:332:546)
4. "INFOSTATIONS- Challenges in the Creation of a New Wireless System" (Fall 1996). A multidisciplinary course involving graduate students from Electrical & Computer Engineering (ECE), Computer Science (CS), and School of Information and Library Studies (SCILS).

TEACHING

1. "Forces and Strategies that Shaped the Wireless Revolution" - Fall 2011,2010,2009,2008
2. "Wireless Personal Communications Systems" - Spring 2007
3. "Probability and Random Processes" - Fall 2001,2000,1999
4. "Wireless System Design" - Spring 2004,2005
5. "Wireless Communication Technologies" - Spring 2013, 2011, 2009,2005, 2004,2002,2001,2000,1999
6. "Communications Engineering" - Fall 2007,2004,1998,1997
7. "Detection and Estimation Theory" - Spring 2012,2010,2008,2006,2003,1998,1997
8. "INFOSTATIONS- Challenges in the Creation of a New Wireless System" - Fall 1996

DEPARTMENT/SCHOOL/UNIVERSITY SERVICE AND ACTIVITIES:

1. ECE Department Strategic Planning Committee, Rutgers University, 2006-present
2. ECE Undergraduate Curriculum Revision Committee, 2012-present
3. Member, Committee on Corporate Partnerships, Office of VP of Research and Economic Development, 2011-12
4. Chair, ECE Chair Search Committee, Rutgers University 2009-10
5. ECE Faculty Search Committee, Rutgers University 2006-2012
6. School of Engineering Academic Promotion and Tenure Committee, Rutgers University - 2007-2008, 2008-2009

7. Faculty Advisor, IEEE Student Branch, Rutgers University, Jan. 1997-December 2002
8. Engineering Orientation Lecture, Rutgers University - November 1996, November 1997, November 1998, December 2001, February 2002, Spring 2009, Fall 2012, Spring 2013,
9. Engineering Open House (led one ECE Department "Info-session" almost every year for the last several years)
10. Undergraduate and Graduate Student Advising
11. Graduate Committees: Scholastic Standing Committee, Graduate Admissions Committee
12. Undergraduate Committees: Scholastic Standing Committee
13. Marshall at School of Engineering Commencement Ceremonies, Rutgers University - 1996-1999, 2010,2011,2012

SOCIETY/TECHNICAL ACTIVITIES:

1. Distinguished Lecturer of the IEEE Communications Society (COMSOC), 2012-15
2. Technical Program Co-Chair, IEEE WiOPT 2011, Princeton NJ
3. Member, IEEE Technical Committee on Green Multimedia Communications (since 2010)
4. Guest Editor, IEEE JSAC Special Issue on Game Theory in Communications and Networking (September 2008)
5. Guest Editor, IEEE JSAC Special Issue on Spectrum Agile Cognitive Radio Networks (April 2007)
6. Editor, IEEE Transactions on Wireless Communications, 2002-2005
7. Associate Editor, IEEE Communications Letters, 1999-2002
8. IEEE Student Branch Counsellor, Rutgers University, Jan. 1997-Dec. 2002
9. Member of Technical Program Committees of several IEEE conferences over the last several years (e.g. ICC, Globecom, DySpaN, CrownComm, WiOPT)
10. Panel Leader and Organizer for "*Communicating in TV White Space*" at IEEE Communication Theory Workshop (CTW'2010), Cancun, Mexico, May 2010
11. Panelist for "*Towards Green Wireless*" at IEEE Saranoff Symposium, Princeton, NJ, April 2010
12. Session Chairman, "Adhoc/Multihop Networks" IEEE International Symposium on Wireless Communications, ISWC'02, Victoria, British Columbia, Canada, September 2002
13. Session Chairman, "MAC Performance" IEEE Vehicular Technology Conference, VTC'02 Fall, Vancouver, Canada, September 2002
14. Session Chairman, "CDMA", Conference on Information Sciences and Systems, CISS'02, Princeton University, March 2002
15. Session Organizer and Chairman, "Multirate Spread Spectrum Techniques and Systems", IEEE International Symposium on Spread Spectrum Techniques and Applications, ISSTA'2000, Parsippany NJ, September 2000
16. Session Organizer and Chairman, "CDMA Performance Enhancements", IEEE International Conference on Communications, ICC'98, Atlanta, GA, June 1998
17. Session Chairman, "Wireless Communications Systems" Conference on Information Sciences and Systems, CISS'99, The Johns Hopkins University, Baltimore, MD, March 1999.
18. Reviewer for IEEE Journals (Transactions on Communications, Transactions on Wireless Communications, Information Theory, Signal Processing, Vehicular Technology, Automatic Control and Selected Areas in Communications)
19. Panelist and Reviewer for National Science Foundation (NSF)