

## NARAYAN B. MANDAYAM

### HOME

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### 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**  
Department Chair, July 2016 - present

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:

- *Distinguished Alumnus Award* from the Indian Institute of Technology (IIT), Kharagpur (2018)
- *Big Ten Academic Alliance (BTAA) Department Executive Officers (DEO) Fellow* – one of 5 Department Chairs selected from over a 100 at Rutgers (2017)
- *Advances in Communication Award* from the IEEE Communications Society (2015) – Awarded to the most impactful paper in any IEEE COMSOC publication over the preceding 15 years
- *Donald G. Fink Award* from the IEEE (2014) - highest paper award across all IEEE Publications in the preceding calendar year
- *National Academies Keck Futures Initiative (NAKFI) Grant Award* (2013)
- Invitee to *National Academies Keck Futures Initiative (NAKFI) Informed Brain in a Digital World* (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)) (2012)
- *Distinguished Lecturer* of the IEEE (2012-15)

- *Peter D. Cherasia Faculty Scholar Award*, Rutgers University (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) for the best paper in a IEEE Communications Society Magazine in the preceding 3 years
- 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 (1999-2003)
- Invitee to *Annual Symposium on Frontiers of Engineering*, National Academy of Engineering (NAE) (one of hundred engineers in the U.S. selected by the NAE) (1999)
- 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 (Awarded to the graduating student with the highest G.P.A. in Electrical Engineering) (1989)
- *National Talent Search Scholarship* Awarded by the National Council of Educational Research and Training, New Delhi, India (1983-1989)

#### **CURRENT RESEARCH INTERESTS:**

- Resilience in Smart Cities
- Prospect Theory in the Design of Cyberphysical Systems
- Privacy and Security for Internet of Things
- Energy Efficient Internet of Things
- End-User Behavior and the Smart Grid
- Microeconomics of Information Centric Networks
- Noncontiguous Spectrum Access and Software Defined Networks
- Modeling of Social Knowledge Creation
- Visual MIMO Networks and Computational Photography

#### **GRANTS:**

1. “COSMOS: Cloud Enhanced Open Software Defined Mobile Wireless Testbed for City-Scale Deployment” National Science Foundation Grant (\$22.5M), April 2018; PI: Dipankar Raychaudhuri, co-PI: Marco Gruteser, Narayan Mandayam, Thu Nguyen, Ivan Seskar (Rutgers is the lead institution in collaboration with Columbia University and NYU)
2. “EAGER: SSDIM: Simulated and Synthetic Data for Interdependent Communications and Energy Critical Infrastructures” National Science Foundation Grant (\$100,000), September 2017; PI: Narayan Mandayam, co-PI: Arnold Glas, Janne Lindqvist
3. “TWC: PERMIT: Privacy-Enabled Resource Management for IoT Networks” National Science Foundation (NSF) Grant No.1617849 (\$500,000), September 2016; - PI: Anand Sarwate, co-PI: Narayan Mandayam
4. “Towards Resilient Smart Cities” National Science Foundation CRISP Grant No. 1541069 (\$900,000), January 2016; PI: Narayan Mandayam, co-PI: Janne Lindqvist, Arnold Glass
5. “EAGER: Renewables: Foundations of Prosumer-Centric Grid Energy Management” National Science Foundation Grant (\$100,000), October 2015; PI: Narayan Mandayam, co-PI: Arnold Glass
6. “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)

7. "NeTS: End-User Behavior and Prospect Pricing in Wireless Data Networks" National Science Foundation (NSF) Grant No. 1421961 (\$500,000), October 2014; - PI: Narayan Mandayam, co-PI: Arnold Glass (Rutgers Psychology)
8. "NeTS: Transmit Only: Green Communication for Dense Wireless Systems" National Science Foundation (NSF) Grant No.1423020 (\$498,000), October 2014; - PI: Yanyong Zhang, co-PI: Narayan Mandayam
9. "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
10. "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
11. "Bandwidth Exchange: A Framework for Enhancing the Performance of Cognitive Radio Networks" Office of Naval Research (ONR) (\$ 300,000), February 2011; - PI: Narayan Mandayam
12. "DEDI: A New Framework for the Practice of Wireless Network Coding" National Science Foundation (NSF) CIF Grant (\$ 427,000 ), September 2010; - PI: Narayan Mandayam
13. "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
14. "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
15. "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
16. "Cooperation and Conflict - Coalitional Games in Spectrum Sharing" National Science Foundation (NSF) Theoretical Foundations Grant, CCF-0634973(\$ 100,000 ), September 2006; - PI: Narayan Mandayam
17. "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
18. "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
19. "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
20. "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
21. "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
22. "Wireless Instructional Lab and Curriculum Development" Intel Corporation (\$ 240,000) September 2002; -PI: Narayan Mandayam, Co-PI : Dipankar Raychaudhuri, Badri Nath
23. "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

24. “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
25. “CAREER: Radio Resource Management for Wireless Data Networks” National Science Foundation (NSF) Career Grant CCR-9874976 (\$ 200,001) September 1, 1999; - PI : Narayan Mandayam
26. “Media Access Control (MAC) Protocols for Wireless Multimedia CDMA Systems” Telcordia Technologies (\$ 10,000) September 1, 1999; -PI: Narayan Mandayam
27. “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
28. “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
29. “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
30. “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
31. “ Capacity and Protocols for Integrated Voice/Data CDMA Systems” National Science Foundation (NSF) NCR 97-06036 (\$ 328,057) October 1, 1997; - PI : Narayan Mandayam
32. “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
33. “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
34. “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)
35. “A Testbed for Multiuser Detection” Office of Naval Research (ONR) (\$ 119,000) January 1, 1997; PI : Narayan Mandayam
36. “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:

- “Resilience in Smart Cities” IEEE Princeton Jersey Section, Princeton, NJ, December 2018
- “Resilience in Smart Cities” University of Electronics Science and Technology (UESTC), Chengdu, China, July 2018
- “Resilience in Smart Cities” Keynote at 60th Anniversary of Computer Science at Tsinghua University, Beijing, China, July 2018
- “Resilience in Smart Cities” Keynote at IEEE Sarnoff Symposium, NJ September 2017
- “Dynamic Spectrum Access in 5G: What’s new?” ECE Colloquium, University of Illinois at Urbana-Champaign, November 2016

- “*Backhauling in TV White Space using LTE-U*” IEEE Distinguished Lecture, NJ Coast Section, Holmdel, NJ, November 2015
- “*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 Net-

- works, 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 Colloquium 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 Colloquium, 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. M. Rajabpour, A. Glass, N. B. Mandayam, and R. Mulligan, “Modeling Prosumer Behavior in the Smart Grid - Decision Making with Bounded Horizon”, in *Data Analytics for Power Systems* A. Tajer, S. Perlaza, H. V. Poor (Eds.), Cambridge University Press UK, 2019
2. M. N. Islam, N. B. Mandayam, I. Seskar and S. Kompella, “System Power Minimization in Non-contiguous Spectrum Access”, in *Handbook on Cognitive Radio*, W. Zhang, J. Huang and X. Chen, (Eds.), Springer, New York 2017

3. 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
4. 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
5. 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
6. 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.
7. 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
8. 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. S. R. Etesami, W. Saad, N. B. Mandayam, and H. V. Poor, "Stochastic Games for Smart Grid Energy Management with Prospect Prosumers," in *IEEE Transactions on Automatic Control*, to appear, 2018.
2. G. El-Rahi, S. R. Etesami, W. Saad, N. B. Mandayam, and H. V. Poor, "Managing Price Uncertainty in Prosumer-Centric Energy Trading: A Prospect-Theoretic Stackelberg Game Approach," in *IEEE Transactions on Smart Grid*, to appear, 2018.
3. L. Xiao, D. Xu, N. B. Mandayam, and H. V. Poor, "Attacker-centric view of a detection game against advanced persistent threats," in *IEEE Transactions on Mobile Computing*, vol. 17, no. 11, pp. 2512-2523, November 2018
4. M. Min, L. Xiao, C. Xie, M. Hajimirsadeghi, N. B. Mandayam, "Defense against advanced persistent threats in dynamic cloud storage: A Colonel Blotto game approach," in *IEEE Internet of Things Journal*, June 2018
5. A. El Abass, L. Xiao, N. B. Mandayam, and Z. Gajic, "Evolutionary Game Theoretic Analysis of Advanced Persistent Threats Against Cloud Storage" in *IEEE Access*, vol. 5, pp. 8482-8491, April 2017
6. M. Hajimirsadeghi, N. B. Mandayam, and A. Reznik, "Joint Caching and Pricing Strategies for Popular Content in Information Centric Networks," in *IEEE Journal on Selected Areas in Communications*, vol. 35, no. 3, pp. 654-667, March 2017
7. L. Xiao, D. Xu, C. Xie, N. B. Mandayam, and H. V. Poor, "Cloud Storage Defense Against Advanced Persistent Threats: A Prospect Theoretic Study," in *IEEE Journal on Selected Areas in Communications*, vol. 35, no. 3, pp. 534-544, March 2017
8. Y. Wang, W. Saad, N. B. Mandayam, and H. V. Poor, "Load Shifting in the Smart Grid: To Participate or Not?," in *IEEE Transactions on Smart Grid*, vol. 7, no. 6, pp. 2604 - 2614, November 2016
9. A. Ashok, C. Xu, T. Vu, M. Gruteser, Y. Zhang, N. B. Mandayam, W. Yuan, K. Dana, "What Am I Looking At? Low-Power Radio-Optical Beacons For In-View Recognition on Smart-Glass," in *IEEE Transactions on Mobile Computing*, 15(12):1-1, December 2016



10. W. Saad, A. Glass, N. B. Mandayam, and H. V. Poor, "Toward a Consumer-Centric Grid: A Behavioral Perspective," in *Proceedings of the IEEE*, vol. 104, No. 4, pp. 865-882, April 2016
11. L. Xiao, J. Liu, Q. Li, N. B. Mandayam, and H. V. Poor, "User-centric View of Jamming Games in Cognitive Radio Networks," in *IEEE Trans. Information Forensics & Security*, vol. 10, no. 12, pp. 2578-2590, Dec. 2015
12. N. B. Mandayam, D. Raychaudhuri, and I. Seskar, "A Software Defined (SDR/SDN) Framework for Heterogeneous Spectrum Sharing," in *IEEE COMSOC TCCN Communications*, vol. 1, No. 1, pp. 13-15, December 2015
13. Y. Yang, L. Park, N. B. Mandayam, I. Seskar, A. Glass, and N. Sinha, "Prospect Pricing in Cognitive Radio Networks," in *IEEE Transactions on Cognitive Communication Networks*, vol. 1, No. 1, pp. 56-70, March 2015
14. 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
15. 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
16. 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
17. 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
18. 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
19. 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**
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## POSTDOCTORAL ADVISEES:

- Kenza Hamidouche, Ph.D. CentraleSupélec, Gif-sur-Yvette, France, 2016
- S. Rasoul Etesami, Ph.D. University of Illinois at Urbana-Champaign, 2015
- Gokul Sridharan, Ph.D. University of Toronto, 2015
- Siun-Chuon Mau, Ph.D. Princeton University, 2000
- Paschalis Ligdas, Ph.D. University of Maryland, 1997

## PAST ADVISEES:

- Ph.D. Students :
  1. Mohammad Hajimirsadeghi, Ph.D. September 2018, Thesis: “Game Theoretic Approaches for Design of Information Centric Networks (ICN) and Spectrum Sharing” (currently at Princeton University)
  2. Ahmed Alabdel A. Abass, Ph.D. May 2018, Thesis: “Evolutionary Games: Applications to Security and Resource Allocation” (currently at University of Thi-Qar, Iraq)
  3. Ratnesh Kumbhkar, Ph.D. December 2017, Thesis: “Opportunistic Access of Noncontiguous Spectrum - Exploring use of Noncontiguous OFDM transmission for Dynamic Spectrum Access” (currently at Marvell Semiconductors)
  4. Kai Su, Ph.D. May 2016, Thesis: “Algorithms and Protocols for Efficient Multicast, Transport, and Congestion Control in Wireless Networks” (currently at VMware) (Co-advisor: D. Raychaudhuri)
  5. Wenjia Yuan, Ph.D. September 2014, Thesis: “Computational Photography Methods for Visual MIMO” (currently at Google) (Co-advisors: K. Dana and M. Gruteser)
  6. Muhammad Nazmul Islam, Ph.D. September 2014, Thesis: “Noncontiguous Spectrum Access and Small Cell Network Design” (currently at Qualcomm)
  7. Ashwin Ashok, Ph.D. June 2014, Thesis: “Design, Modeling and Analysis of Visual MIMO Communication” (currently at CMU) (Co-advisor: M. Gruteser, K. Dana)
  8. Narayanan Krishnan, Ph.D. September 2013, Thesis: “Bandwidth Sharing and Massive MIMO for Next Generation Cellular Systems” (currently at Qualcomm) (Co-advisor: R. Yates)
  9. Tianming Li, Ph.D. September 2013, Thesis: “Cognitive Radio Networks: Resource Allocation and Effect of End-User Behavior” (currently at J. P. Morgan)
  10. Dan Zhang, Ph.D. September 2012, Thesis: “On the Dynamics of Random Network Coding” (currently at Qualcomm)
  11. 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)
  12. 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)
  13. 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)
  14. Zhuyu Lei, Ph.D. December 2008, Thesis: “Utility-based Power Control for Packet-Switched Wireless Networks” (currently at Alcatel-Lucent, IL)
  15. 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)



16. 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))
  17. 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)
  18. Hitesh Nama, Ph.D. February 2007, Thesis: “Resource Allocation in Cooperative and Non-cooperative Energy-constrained Wireless Networks” (currently at Marvel Semiconductor)
  19. Salim Manji, Ph.D. September 2004, Thesis: “Rate Adaptation Strategies for Progressive Image Transmission over Fading Channels” (currently at Spirent Technologies, NJ)
  20. Nan Feng, Ph.D. July 2004, Thesis: “User Centric and Network Centric Radio Resource Management” (currently at Alcatel-Lucent Technologies, NJ)
  21. Dragan Samardzija, Ph.D. April 2004, Thesis: “Multiple Antenna Wireless Systems and Channel State Information” (currently at Bell Labs, Alcatel-Lucent Technologies, NJ)
  22. Heng Wang, Ph.D. December 2002, Thesis: “Opportunistic Transmission for Wireless Data over Fading Channels under Energy and Delay Constraints” (currently at Qualcomm)
  23. 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)
  24. Jie Lai, Ph.D., August 2001, Thesis: “Performance of Channel Coding on Temporally and Spatially Correlated Wireless Channels” (currently at Broadcom Inc.)
  25. Lei Song, Ph.D., August 2001, Thesis: “Resource Allocation Based on Hierarchical and Nonlinear Control in Wireless Networks” (currently at UTStar Telecom Inc.)
  26. Cem Saraydar, Ph.D., December 2000, Thesis: “Pricing and Power Control in Wireless Data Networks” (currently at GM Research)
- M.S. Students :
    1. Leonard Park, M. S. April 2016, Thesis: “Psychophysics Testbed and Experiments for Assessing End-User Perception of Video QoS over Wireless Channels”
    2. Cyrus Gerami, M.S. May 2011, Thesis: “Spatio-Spectral Mapping of TV White Space in NJ”
    3. Tejaswy Hari, M.S. October 2009, Thesis: “Implementation of an Adaptive MIMO-OFDM Cognitive Radio”
    4. Suhas Mathur, M. S. October 2006, Thesis: “Coalitional Games in Cooperative Networks”
    5. Omer Ileri, M. S. October 2003, Thesis: “Pricing for Enabling Forwarding in Wireless Adhoc Networks”
    6. Shrenik Patel, M.S., December 2002, Thesis: “Comparative Evaluation of OFDM and Single-Carrier Equalization Schemes for Infostation Channels” (currently at Time Domain Inc.)
    7. Andrej Domazetovic, M.S., September 2002, Thesis: “Propagation Models for Short-Range Wireless Channels with Predictable Path Geometries” (currently at Iiquity Digital)
    8. Shaily Verma, M.S., July 2001, Thesis: “QoS Provisioning for Mobile Internet Access via GPRS/EDGE” (currently at Thomson Electronics)
    9. Dragan Samardzija, M.S., June 2000, Thesis: “Blind Interference Cancellation Schemes for DS-CDMA Systems” (currently at Lucent Technologies)
    10. 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)

11. Kamesh Medapalli, M.S., December 1998, Thesis: "TDMA Interference Cancellation and Equalization using Tentative Decisions" (currently at Stanford University)
12. Viral Shah, M.S., March 1998, Thesis: "Power Control for Wireless Data Services based on Utility and Pricing" (currently at Qualcomm, Inc.)
13. 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. Ratnesh Kumbhkar, Ph.D. Thesis: SDN based Noncontiguous Spectrum Access
  2. Mohammad Hajimirsadeghi, Ph.D. Thesis: Microeconomic Design of Information Centric Networks
  3. Sudhir Pattar, Ph.D. Thesis: Broadcast Broadband Convergence
  4. Sijie Xiong, Ph.D. Thesis: TBD (co-advisor with A. Sarwate)
  5. Tejashri Kuber, Ph.D. Thesis: SDR Implementation of Noncontiguous Spectrum Sharing
  6. Neelakantan Krishnan, Ph.D. Thesis: TBD (co-advisor with R. Yates)
  7. Mohammad Yousefvand, Ph.D. Thesis: TBD
  8. Xu Zhao, Ph.D. Thesis: TBD

#### **THESIS COMMITTEES SERVED ON:**

1. Ph.D. Committees: Mohammad Saquib, Fangchen Chen, Sennur Ulukus, Sudhir Ramakrishna, Pi-chun Chen, Joan Borras, Wei Ma, Jun Li, Aylin 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, Shubb Agarwal, Ivan Seskar, Jignesh Panchal, David Famolari, David Pandian, Jin Wang, Hua Mao, David Tabora, Nanyan Jiang, Kemal Karakayali, Kinjal Shah, Pavan Kaivaram, Neville Celems, Shanmuga Sundaram Anandaraman, Yaqin Tang

#### **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 Kasmer)

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 Sorooshyari) 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. "Introduction to Computers for Engineers" - Fall 2015
2. "Forces and Strategies that Shaped the Wireless Revolution" - Fall 2014, 2013, 2011,2010,2009,2008
3. "Wireless Personal Communications Systems" - Spring 2007
4. "Probability and Random Processes" - Fall 2001,2000,1999
5. "Wireless System Design" - Spring 2004,2005
6. "Wireless Communication Technologies" - Spring 2015, 2013, 2011, 2009,2005, 2004,2002,2001,2000,1999
7. "Communications Engineering" - Fall 2007,2004,1998,1997
8. "Detection and Estimation Theory" - Spring 2014, 2012,2010,2008,2006,2003,1998,1997
9. "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, ISSA’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)