

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

Narayan B. Mandayam is a Distinguished Professor of Electrical and Computer Engineering at Rutgers University, where he also serves as Director of the Wireless Information Network Laboratory (WINLAB). He served as Chair of the ECE department from July 2016-June 2022. Using constructs from game theory, prospect theory, communications and networking, his work has focused on system modeling, information processing as well as resource management for enabling cognitive wireless technologies to support various applications. His recent interests include understanding the psychophysics of end-user behavior on cloud security, wireless data networks and the smart grid; enabling privacy in IoT; building resilience in smart city infrastructures; machine learning for enhancing physics based models; as well as modeling and analysis of trustworthy knowledge creation on the internet. Dr. Mandayam is a recipient of the *2015 IEEE Communications Society Advances in Communications Award* (given to the most impactful paper in the preceding 15 calendar years) for his work on power control and pricing, the *2014 IEEE Donald G. Fink Award* for his IEEE Proceedings paper titled *Frontiers of Wireless and Mobile Communications* and the *2009 Fred W. Ellersick Prize* from the IEEE Communications Society for his work on dynamic spectrum access models and spectrum policy. He is also a recipient of the Peter D. Cherasia Faculty Scholar Award from Rutgers University (2010), the National Science Foundation CAREER Award (1998), the Institute Silver Medal from the Indian Institute of Technology, Kharagpur (1989) and its Distinguished Alumnus Award (2018). He is an IEEE Fellow and Distinguished Lecturer.

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
Department Chair July 2016 - June 2022
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
Director Acting (August 2023 - present), Interim (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

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) – highest (“test of time”) paper award of IEEE COMSOC; awarded to the most impactful paper in any IEEE COMSOC publication over the preceding 15 calendar 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)- “From Informed Human Brains to Society-Scale Silicon Brains: Uncovering the DNA of Social Knowledge”
- 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 calendar 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:

- Behavioral Models and Cloud Security
- Machine Learning for Enhancing Physics Based Models for Security and Networking
- Privacy and Security in Internet of Things
- Resilience in Smart Cities
- Prospect Theory in the Design of Cyberphysical Security
- Cognitive Public Alerts for Enhancing Public Safety Operations during Emergencies
- 5G and Beyond 5G Networks
- Reality Aware Networks
- Enabling Passive Spectrum Coexistence
- Resource Allocation in Wireless Networks using Non Radio Attributes
- End-User Behavior and the Smart Grid
- Modeling of Social Knowledge Creation

GRANTS: (PI or co-PI on ~ \$42M funding from Federal, State and Industry Sources)

1. "FMRG: Cyber: Manufacturing USA: NextG-Enabled Manufacturing of the Future (NextGEM)," National Science Foundation Grant (\$2,999,632), June 2024; PI: Yuebin Guo, co-PI: Yingying Chen, Narayan Mandayam, Jiangang Yi, Weihong Guo
2. "SWIFT: Software Defined Radio based Emulation of SAT-Terrestrial Network Coexistence in "FR3" Bands," National Science Foundation Grant (\$750,000), October 2023; PI: Narayan Mandayam, co-PI: Ivan Seskar, Chung-Tse Michael Wu
3. "SWIFT: Intelligent Spatio-Temporal Metamaterial Massive MIMO Aperture Arrays with Hybrid Learning-based Channel Classifiers for Spectrum-Efficient Secured Wireless Communication," National Science Foundation Grant (\$750,000), October 2022; PI: Chung-Tse Michael Wu, co-PI: Narayan Mandayam, Waheed Bajwa
4. "SWIFT: Enabling Spectrum Coexistence of 5G mmWave and Passive Weather Sensing," National Science Foundation Grant (\$750,000), October 2021; PI: Narayan Mandayam, co-PI: Chung-Tse Michael Wu, Ruo-Qian Wang, Joseph Brodie
5. "Standalone Mobile Core Network (SA-MCN) Architecture and Enabling Technologies- Phase II," US Department of Defense Contract (\$1,315,000), October 2020; PI: Narayan Mandayam, co-PI: Dipankar Raychaudhuri, Ivan Seskar
6. "EAGER: SARE: Directional Modulation Non-Contiguous OFDM Retrodirective Communication for Secure IoT," National Science Foundation Grant (\$300,000), September 2020; PI: Chung-Tse Michael Wu, co-PI: Narayan Mandayam, Waheed Bajwa
7. "SII Planning: ARIES: Center for Agile, Reliable, Scalable Spectrum," National Science Foundation Grant (\$300,000), August 2020; PI: Walid Saad, co-PI: Narayan Mandayam, Douglas Sicker, Andreas Molisch, Harpreet Dhillon
8. "Standalone Mobile Core Network (SA-MCN) Architecture and Enabling Technologies," US Department of Defense Contract (\$450,000), August 2019; PI: Narayan Mandayam, co-PI: Dipankar Raychaudhuri, Ivan Seskar
9. "Reality-Aware Networks" National Science Foundation Grant (\$800,000), April 2018; PI: Marco Gruteser, co-PI: Kristin Dana, Narayan Mandayam (Rutgers is the lead institution in collaboration with Old Dominion University and Georgia State University).
10. "COSMOS: Cloud Enhanced Open Software Defined Mobile Wireless Testbed for City-Scale Deployment" National Science Foundation Grant (\$12.5M), 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)
11. "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 Glass, Janne Lindqvist
12. "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
13. "Towards Resilient Smart Cities" National Science Foundation CRISP Grant No. 1541069 (\$900,000), January 2016; PI: Narayan Mandayam, co-PI: Janne Lindqvist, Arnold Glass
14. "EAGER: Renewables: Foundations of Prosumer-Centric Grid Energy Management" National Science Foundation Grant (\$100,000), October 2015; PI: Narayan Mandayam, co-PI: Arnold Glass
15. "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)
16. "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)

17. "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
18. "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
19. "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
20. "Bandwidth Exchange: A Framework for Enhancing the Performance of Cognitive Radio Networks" Office of Naval Research (ONR) (\$ 300,000), February 2011; - PI: Narayan Mandayam
21. "DEDI: A New Framework for the Practice of Wireless Network Coding" National Science Foundation (NSF) CIF Grant (\$ 427,000), September 2010; - PI: Narayan Mandayam
22. "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
23. "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
24. "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
25. "Cooperation and Conflict - Coalitional Games in Spectrum Sharing" National Science Foundation (NSF) Theoretical Foundations Grant, CCF-0634973(\$ 100,000), September 2006; - PI: Narayan Mandayam
26. "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
27. "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
28. "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
29. "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
30. "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
31. "Wireless Instructional Lab and Curriculum Development" Intel Corporation (\$ 240,000) September 2002; -PI: Narayan Mandayam, Co-PI : Dipankar Raychaudhuri, Badri Nath
32. "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
33. "'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

34. "CAREER: Radio Resource Management for Wireless Data Networks" National Science Foundation (NSF) Career Grant CCR-9874976 (\$ 200,001) September 1, 1999; - PI : Narayan Mandayam
35. "Media Access Control (MAC) Protocols for Wireless Multimedia CDMA Systems" Telcordia Technologies (\$ 10,000) September 1, 1999; -PI: Narayan Mandayam
36. "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
37. "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
38. "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
39. "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
40. "Capacity and Protocols for Integrated Voice/Data CDMA Systems" National Science Foundation (NSF) NCR 97-06036 (\$ 328,057) October 1, 1997; - PI : Narayan Mandayam
41. "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
42. "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
43. "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)
44. "A Testbed for Multiuser Detection" Office of Naval Research (ONR) (\$ 119,000) January 1, 1997; PI : Narayan Mandayam
45. "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:

- "AI/ML Enabled Security in Wireless Networks" ARO Workshop, Philadelphia PA November 2022
- "Passive Spectrum Coexistence: Impact of 5G mmWave Leakage on Weather Prediction" VAIBHAV, New Delhi, India October 2020
- "Resilience in Smart Cities" Stevens Institute of Technology, NJ, October 2020
- "Resilience in Smart Cities" Lehigh University, PA, February 2020
- "Resilience in Smart Cities" Indian Institute of Technology (IIT)-Hyderabad, India, January 2020
- "Resilience in Smart Cities" Drexel University, Philadelphia, PA, March 2019
- "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

- “Wireless Network Security” Central Intelligence Agency, Directorate of Science and Technology’s 2018 Summer Symposium, Langley, VA, June 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 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 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, 2021
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. R. K. Patel, Y. Yuan, R. S. Bisht, I. Seskar, N. Mandayam, S. Ramanathan, "High-speed sensing of RF signals with phase change material," in *Physical Review Applied*, under revision, 2024
2. W. Saad, O. Hashash, C. K. Thomas, C. Chaccour, M. Debbah, N. B. Mandayam, and Z. Han, "Artificial General Intelligence (AGI)-Native Wireless Systems: A Journey Beyond 6G," *Proceedings of the IEEE* (invited), 2024
3. S. Anand, O. Arazy, N. B. Mandayam and O. Nov, "A Game-Theoretic Analysis of Wikipedia's Peer Production: the Interplay between Community's Governance and Contributors' Interactions," in *PLOS ONE* 18(5): e0281725. <https://doi.org/10.1371/journal.pone.0281725>, 2023
4. A. Nooraiepour, S. Vosoughitabar, C.-T. M. Wu, W. U. Bajwa, and N. B. Mandayam, "Time-varying metamaterial-enabled directional modulation schemes for physical layer security in wireless communication links," in *ACM Journal on Emerging Technologies in Computing Systems*, vol. 18, no. 4, October 2022, doi: 10.1145/3513088.
5. M. Yousefvand, D. Lambropoulos and N. Mandayam, "CPAWS: Cognitive Public Alerts to Wireless Subscribers for Enhancing Public Safety Operations during Emergencies," in *IEEE Communications Magazine*, doi: 10.1109/MCOM.001.2100897, October 2022
6. M. R. Rahman, T. V. Sethuraman, M. Gruteser, K. Dana, S. Jain, N. Mandayam, and A. Ashok "Camera-Based Light Emitter Localization Using Correlation of Optical Pilot Sequences," in *IEEE Access*, vol. 10, pp. 24368-24382, 2022, doi: 10.1109/ACCESS.2022.3153708.
7. A. Nooraiepour, W. U. Bajwa, and N. B. Mandayam, "A hybrid model-based and learning-based approach for classification using limited number of training samples," in *IEEE Open Journal of Signal processing*, vol. 3, pp. 49-70, 2022

8. M. Yousefvand, K. Hamidouche, N. B. Mandayam, "Learning End-User Behavior for Optimized Bidding and User/Network Association," in *IEEE Transactions on Cognitive Communication Networks*, vol. 7, no. 3, pp. 845-855, September 2021
9. A. Nooraiepour, W. U. Bajwa, N. B. Mandayam, "Learning-Aided Physical Layer Attacks Against Multicarrier Communications in IoT," in *IEEE Transactions on Cognitive Communication Networks*, vol. 7, Issue 1, March 2021
10. A. A. Alabdel Abass, N. B. Mandayam, and Z. Gajic, "Evolutionary Random Access Game With Objective and Subjective Players," in *IEEE Access*, vol. 9, pp. 35562 - 35572, February 2021
11. A. Ferdowsi, W. Saad, N. B. Mandayam, "Colonel Blotto Game for Sensor Protection in Interdependent Critical Infrastructure," in *IEEE Internet of Things Journal* vol. 8, Issue 4, pp. 2857 - 2874, February 2021
12. A. Eldosouky, W. Saad, N. B. Mandayam, "Resilient Critical Infrastructure: Bayesian Network Analysis and Contract-Based Optimization," in *Reliability Engineering & System Safety*, January 2021
13. N. N. Krishnan, E. Torkildson, N. B. Mandayam, D. Raychaudhuri, E. Rantala, K. Doppler, "Optimizing Throughput Performance in Distributed MIMO Wi-Fi Networks Using Deep Reinforcement Learning," in *IEEE Transactions on Cognitive Communication Networks*, DOI: 10.1109/TCCN.2019.2942917, September 2019
14. K. Miyano, R. Shinkuma, N. B. Mandayam, T. Sato, and E. Oki, "Utility Based Scheduling for Multi-UAV Search Systems in Disaster-Hit Areas," in *IEEE Access*, vol. 7, pp. 26810 - 26820, February 2019
15. 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*, vol. 10, no. 1, January 2019
16. 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
17. 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*, vol. 63, no. 8, pp. 2327-2342, August 2018
18. 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
19. 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
20. 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
21. 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
22. 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
23. 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
24. 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

25. 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
26. 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
27. 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
28. 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
29. 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
30. 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
31. 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
32. 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
33. 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**
34. 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
35. 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
36. 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
37. 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
38. 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
39. 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
40. 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
41. 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

42. 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
43. 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
44. 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
45. 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
46. 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
47. 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
48. 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
49. 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
50. 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**
51. 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
52. 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
53. 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
54. 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
55. 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
56. 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
57. 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
58. 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

59. 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
60. 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
61. 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
62. 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
63. H. Wang, N. B. Mandayam “A Simple Packet Scheduling Scheme for Wireless Data over Fading Channels” in *IEEE Trans. on Communications*, vol. 52, No. 7, pp. 1055-1059, July 2004
64. J. Lai, N. B. Mandayam, “Performance Analysis of Convolutionally Coded DS/CDMA Systems with Spatial and Temporal Channel Correlations” in *IEEE Trans. on Communications*, vol. 51, No. 12, pp. 1984-1990, December 2003
65. D. Samardzija, N. B. Mandayam, “Pilot Assisted Estimation of MIMO Fading Channel Response and Achievable Data Rates” in *IEEE Trans. on Signal Processing*, Special Issue on MIMO, vol. 51, pp. 2882-2890, November 2003
66. C. Comaniciu, N. B. Mandayam, D. Famolari and P. Agrawal “Wireless Access to the World Wide Web in an Integrated CDMA System”, in *IEEE Transactions on Wireless Communications*, vol. 2, No. 3, pp. 472-483, May 2003
67. A. Domazetovic, L. Greenstein, N. Mandayam, I. Seskar “Estimating the Doppler Spectrum of a Short-Range Fixed Wireless Channel” in *IEEE Communications Letters*, vol. 7, No. 2, pp. 227-229, May 2003
68. C. Saraydar, N. B. Mandayam, D. J. Goodman, “Efficient Power Control via Pricing in Wireless Data Networks” in *IEEE Trans. on Communications*, vol. 50, No. 2, pp. 291-303, February 2002 **This paper was awarded the 2015 Advances in Communication Award by the IEEE Communications Society**
69. D. Samardzija, N. B. Mandayam and I. Seskar “Blind Successive Interference Cancellation for DS-CDMA Systems”, in *IEEE Trans. on Communications*, vol. 50, No. 2, pp. 276-290, February 2002
70. D. Samardzija, N. B. Mandayam and I. Seskar “Multistage Nonlinear Blind Interference Cancellation for DS-CDMA Systems”, in *Journal of VLSI Processing*, vol. 30, pp. 257-271, 2002
71. L. Song, N. B. Mandayam, “Hierarchical SIR and Rate Control on the Forward Link for CDMA Data Users under Delay and Error Constraints” in *IEEE Journal on Selected Areas in Communications*, vol. 19, No. 10, pp. 1871-1882, October 2001
72. C. Saraydar, N. B. Mandayam, D. J. Goodman, “Pricing and Power Control in a Multicell Wireless Data Network” in *IEEE Journal on Selected Areas in Communications*, vol. 19, No. 10, pp. 1883-1892, October 2001
73. J. Lai, N.B. Mandayam “Minimum Duration Outages in Rayleigh Fading Channels” in *IEEE Trans. on Communications*, vol. 49, No. 10, pp. 1755-1761, October 2001
74. D. J. Goodman, N. B. Mandayam, “Network Assisted Power Control for Wireless Data”, in *Mobile Networks and Applications*, vol. 6, No. 5, pp. 409-415, 2001
75. L. Song, N. B. Mandayam, Z. Gajic “Analysis of an Up/Down Power Control Algorithm for the CDMA Reverse Link under Fading” in *IEEE JSAC Wireless Series*, vol. 19, No. 2, pp. 277-286, February 2001

76. J. Lai, N. B. Mandayam, "Performance of Reed-Solomon Codes for Hybrid-ARQ over Rayleigh Fading Channels under Imperfect Interleaving" in *IEEE Trans. on Communications*, vol. 48, No. 10, pp. 1650-1659, October 2000
77. 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", in *Journal of Mobile Networks and Applications*, 5 (2000) pp. 199-208, 2000
78. Z. Lei, C. Saraydar, N. B. Mandayam, "Paging Area Configuration based on Interval Estimation for Personal Communication Networks", in *Journal of Mobile Networks and Applications*, 5 (2000), 1, Special Issue on Mobile Data Networks: Advanced Technologies and Services, pp. 85-99, 2000
79. D. Ramakrishna, N. B. Mandayam, R. Yates "Subspace Based Estimation of the Signal to Interference Ratio for CDMA Cellular Systems", in *IEEE Trans. on Veh. Tech.*, vol. 49, no. 3, September 2000
80. R. D. Yates, N. B. Mandayam, "Challenges in Low-Cost Wireless Data Transmission" in *Signal Processing Magazine*, pp. 93-102, May 2000
81. D. J. Goodman, N. B. Mandayam, "Power Control for Wireless Data ", in *IEEE Personal Communications*, pp. 48-54, April 2000
82. C. Comaniciu, N. B. Mandayam, "Delta Modulation based Prediction for Access Control in Integrated Voice/Data CDMA Systems", in *IEEE JSAC*, vol. 18, No. 1, pp. 112-122, January, 2000
83. I. Seskar, N. B. Mandayam, "Software Defined Radio Architectures for Interference Cancellation in DS-CDMA Systems", in *IEEE Personal Communications*, vol. 6, No. 4, pp. 26-34, September 1999 (Invited Paper)
84. I. Seskar, N. B. Mandayam, "A Software Radio Architecture for Linear Multiuser Detection", in *IEEE Journal of Selected Areas on Communications*, vol. 17, no. 5, pp. 814-823, May 1999
85. M. Saquib, R. Yates, N.B. Mandayam "A Class of Decorrelating Detectors for a Dual Rate Synchronous DS/CDMA System," in *Wireless Personal Communications*, vol. 9, no. 3, pp. 197-216, May 1999
86. I. Seskar, N. B. Mandayam, P. Hatrack, "Reconfigurable Testbed for Interference Cancellation in DS-CDMA Systems", in *International Journal of Wireless Information Networks*, vol. 6, no. 1, pp. 37-48, 1999
87. M. Saquib, R. Yates, N.B. Mandayam "A Decision Feedback Decorrelating Detector for a Dual Rate Synchronous DS/CDMA Channel," in *Wireless Networks*, vol. 4, no. 6, pp. 497-506, 1998
88. N.B. Mandayam, P.C. Chen, J. Holtzman "Minimum Duration Outages for CDMA Cellular Systems : A Level Crossing Analysis", in *Special Issue on CDMA for Universal Personal Communications, Wireless Personal Communications*, vol. 7, no. 2/3, pp. 135-146, August 1998
89. M. Andersin, N.B. Mandayam, R. Yates "Subspace based SIR Estimation for Cellular Systems," in *Wireless Networks*, vol. 4, no. 3, pp. 241-247, April 1998
90. J. Panchal, O. E. Kelly, J. Lai, N. B. Mandayam, A. T. Ogielski, R. D. Yates, "Parallel Simulations of Wireless Networks with TED: Radio Propagation, Mobility and Protocols", in *Performance Evaluation Review, ACM Sigmetrics*, vol. 25, no. 4, pp. 30-39, March, 1998.
91. N.B. Mandayam, S. Verdú "Analysis of an Approximate Decorrelating Detector," in *Special Issue on Interference in Mobile Wireless Systems, Wireless Personal Communications*, vol. 6, no. 1-2, pp. 97-111, January 1998
92. N.B. Mandayam, B. Aazhang "Gradient Estimation for Sensitivity Analysis and Adaptive Multiuser Interference Rejection in Code Division Multiple Access (DS-CDMA) Systems," in *IEEE Transactions on Communications*, vol. 45, pp.848-858, July, 1997

93. N.B. Mandayam, B. Aazhang “Gradient Estimation for Stochastic Optimization of Optical Code Division Multiple Access Systems - part I: Generalized Sensitivity Analysis” in *IEEE Journal of Selected Areas in Communications*, vol. 15, pp. 731-741, May 1997
94. N.B. Mandayam, B. Aazhang “Gradient Estimation for Stochastic Optimization of Optical Code Division Multiple Access Systems - part II: Adaptive Detection” in *IEEE Journal of Selected Areas in Communications*, vol. 15, pp. 742-750, May 1997
95. N.B. Mandayam, B. Aazhang “Importance Sampling for Analysis of Direct Detection Optical Communication Systems”, in *IEEE Transactions on Communications*, vol. 43, pp.229-239, February, 1995

Conference Papers

1. S. Vosoughitabar, A. Nooraiepour, W. U. Bajwa, N. B. Mandayam, C. T. M. Wu, “Directional Modulation Retrodirective Array-Enabled Physical Layer Secured Transponder for Protected Wireless Data Acquisition,” in Proceedings of IEEE International Microwave Symposium (IMS 2023), San Diego, CA, June 2023
2. B. Golparvar, S. Vosoughitabar, I. Majumdar, J.F. Brodie, N.B. Mandayam, C.T.M. Wu, R.Q. Wang, “Impact of Future Spatio-Temporal 5G Leakage on Weather Forecasting Accuracy,” in 103rd Annual American Meteorological Society (AMS) Meeting, Denver CO, January 2023
3. B. Golparvar, I. Majumdar, S. Vosoughitabar, J. Brodie, N. Mandayam, C.T. M. Wu, R.Q. Wang, ”A study on the Impact of Non-Uniform 5G Leakage on the Accuracy of Weather Forecasts,” American Geophysical Union (AGU) 2022 Fall Meeting. Chicago, IL, December 2022
4. I. B. Majumdar, S. Vosoughitabar , C.T.M. Wu , N.B. Mandayam, J.F. Brodie, B. Golparvar, R.Q. Wang, “Resource Allocation Using Filtennas in the Presence of Leakage,” in 2022 IEEE Future Networks World Forum (FNWF). Montreal, Canada, October 2022
5. B. Golparvar, R.Q. Wang, J.F. Brodie, C.T.M. Wu, N.B. Mandayam, S. Vosoughitabar, I. Majumdar, “Spatio-temporal analysis of the impact of 5G mmWave technology deployment on the weather forecast accuracy,” in 8th International Symposium on Data Assimilation (ISDA). Fort Collins, CO, June 2022
6. Z. Aref and N. B. Mandayam, “Impact of Subjectivity in Deep Reinforcement Learning based Defense of Cloud Storage” In IEEE INFOCOM 2022 (INFOCOM WKSHP), May 2022
7. A. Nooraiepour, W. U. Bajwa, N. B. Mandayam, “Hyphylearn: A domain adaptation-inspired approach to classification using limited number of training samples,” 31st IEEE International Workshop on Machine Learning for Signal Processing (MLSP), 2021
8. T. Kuber, I. Seskar, N. B. Mandayam, “Traffic Prediction by Augmenting Cellular Data with Non-Cellular Attributes,” in Proceedings of IEEE Wireless Communications and Networking Conference (WCNC), Nanjing, China, March 2021
9. N. Nurani Krishnan, I. Seskar, N. B. Mandayam, “On Enhancing Throughput Performance of Wi-Fi Networks: Combining Coordinated AP and mmWave Bands,” in Proceedings of IEEE Consumer Communications and Networking Conference (CCNC), January 2021
10. T. Nishio, R. Shinkuma and N. B. Mandayam, “Estimation of Individual Device Contributions for Incentivizing Federated Learning,” in 2020 IEEE Globecom, (GC Wkshps, 2020, pp. 1-6, doi: 10.1109/GCWkshps50303.2020.9367484).
11. M. Yousefvand, C. T. M. Wu, R. Wang, J. Brodie, N. B. Mandayam “Modeling the Impact of 5G Leakage on Weather Prediction,” in Proceedings of 2020 IEEE 5G World Forum, Bengaluru, India, September 2020
12. M. Yousefvand, K. Hamidouche, N. B. Mandayam, “Learning based resource optimization in ultra reliable low latency HetNets,” in Proceedings of IEEE Globecom Conference, Waikoloa, HI, USA, November 2019

13. A. Ferdowsi, U. Challita, W. Saad, N. B. Mandayam, "Robust Deep Reinforcement Learning for Security and Safety in Autonomous Vehicle Systems," in Proceedings of the 21st IEEE International Conference on Intelligent Transportation Systems, Maui, HI, USA, November 2018
14. A. Nooraiepour, K. Hamidouche, W. U. Bajwa, N. B. Mandayam, "How Secure are Multicarrier Communication Systems Against Signal Exploitation Attacks?," in Proceedings of IEEE Military Communications (MILCOM), Los Angeles, CA, October 2018
15. N. Nurani Krishnan, E. Torkildson, E. Rantala, I. Seskar, N. B. Mandayam, K. Doppler, "D-MIMOO — Distributed MIMO for Office Wi-Fi Networks," in Proceedings of IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN), Seoul, South Korea, October 2018
16. N. Nurani Krishnan, N. B. Mandayam, I. Seskar, S. Kompella, "Experiment: Investigating Feasibility of Coexistence of LTE-U with a Rotating Radar in CBRS Bands," in Proceedings of IEEE 5G World Forum, pp. 65-70, Santa Clara, CA, July 2018
17. M. Yousefvand, M. Hajimirsadeghi and N. B. Mandayam, "Impact of End-User Behavior on User/Network Association in HetNets," in Proceedings of IEEE International Conference on Communications (ICC), Kansas City, MO, pp. 1-7, May 2018
18. S. Xiong, A. D. Sarwate, and N. B. Mandayam, "Defending Against Packet-Size Side-Channel Attacks in IoT Networks," in 2018 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), pp. 2027-2031, April 2018
19. S. R. Etesami, W. Saad, N. B. Mandayam, and H. V. Poor, "Smart Routing in Smart Grids," in Proceedings of the 56th IEEE Conference on Decision and Control (CDC), Melbourne, Australia, December 2017
20. N. Nurani Krishnan, R. Kumbhkar, N. B. Mandayam, I. Seskar, S. Kompella, "How Close Can I Be?-A Comprehensive Analysis of Cellular Interference on ATC Radar," in Proceedings of IEEE Global Communications Conference (GLOBECOM), pp. 1-6, Singapore, December 2017
21. N. Nurani Krishnan, R. Kumbhkar, N. B. Mandayam, I. Seskar, S. Kompella, "Coexistence of radar and communication systems in CBRS bands through downlink power control," in Proceedings of IEEE Military Communications Conference (MILCOM), pp. 713-718, Baltimore, MD, October 2017
22. A. Ferdowsi, A. Sanjab, W. Saad, and N. B. Mandayam, "Game Theory for Secure Critical Interdependent Gas-Power-Water Infrastructure," in Proceedings of Resilience Week - Critical Infrastructure Track, Wilmington, DE, USA, September 2017
23. M. Hajimirsadeghi, N. B. Mandayam, "A Dynamic Colonel Blotto Game Model for Spectrum Sharing in Wireless Networks," in Proceedings of the 55th Annual Allerton Conference on Communications, Control and Computing, Allerton, IL, pp. 287-294, September 2017
24. A. Garnaev, W. Trappe, R. Kumbhkar, and N. B. Mandayam, "Impact of Uncertainty About a User to be Active on OFDM Transmission Strategies," in Proceedings of International Conference on Cognitive Radio Oriented Wireless Networks, Lisbon, Portugal, September 2017
25. Y. Zhang, B. Firner, R. Howard, R. Martin, N. B. Mandayam, J. Fukuyama, and C. Xu, "Transmit Only: An Ultra Low Overhead MAC Protocol for Dense Wireless Systems," in 2017 IEEE International Conference on Smart Computing (SMARTCOMP 2017), pp. 1-8, Hong Kong, China, May 2017
26. D. Xu, L. Xiao, N. B. Mandayam, H. V. Poor, "Cumulative Prospect Theoretic Study of a Cloud Storage Defense Game Against Advanced Persistent Threats," in Proceedings of the IEEE International Conference on Computer Communications (INFOCOM), -BigSecurity, Atlanta, GA, May 2017
27. M. Min, L. Xiao, C. Xie, M. Hajimirsadeghi, N. B. Mandayam, "Defense Against Advanced Persistent Threats: A Colonel Blotto Game Approach," in Proceedings of IEEE International Conference on Communications (ICC), Paris, May 2017

28. N. Nurani Krishnan, G.Sridharan, I. Seskar, N.B. Mandayam, "Coverage and Rate Analysis of Super Wi-Fi Networks using Stochastic Geometry," in Proceedings of IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN), pp. 276-285, Baltimore, MD, March 2017
29. D. Xu, Y. Li, L. Xiao, N. B. Mandayam, and H. V. Poor, "Prospect Theoretic Study of Cloud Storage Defense Against Advanced Persistent Threats," in Proceedings of IEEE Global Commun. Conf. (GLOBECOM), Washington, DC, Dec. 2016
30. G. Sridharan, R. Kumbhkar, N. B. Mandayam, I. Seskar, and S. Kompella, "Physical Layer Security of NC-OFDM-based Systems," in Proceedings of Military Communications Conference (MILCOM 2016), Baltimore MD, November 2016
31. G. El Rahi, A. Sanjab, W. Saad, N. B. Mandayam, and H. V. Poor "Prospect Theory for Enhanced Smart Grid Resilience Using Distributed Energy Storage," in Proceedings of the 54th Annual Allerton Conference on Communications, Control and Computing, Allerton, IL, September 2016
32. A. Ferdowsi, W. Saad, B. Maham, and N. B. Mandayam, "A Colonel Blotto Game for Interdependence Aware Security Resource Allocation in Cyber-Physical Systems," in Proceedings of IEEE/ACM CPS Week, Workshop on Smart City Security and Privacy, Vienna, Austria, April 2016
33. V. Nguyen, Y. Tang, A. Ashok, M. Gruteser, K. Dana, W. Hu, E. Wengrowski, and N. B. Mandayam, "High-Rate Flicker-Free Screen-Camera Communication with Spatially Adaptive Embedding," in Proceedings of IEEE INFOCOM 2016, San Francisco, CA, April 2016
34. S. Xiong, A. D. Sarwate, and N. B. Mandayam, "Randomized requantization with local differential privacy," in Proceedings of the 2006 International Conference on Acoustics, Speech and Signal Processing (ICASSP), Shanghai, China, pp. 2189–2193, March 2016
35. R. Kumbhkar, G. Sridharan, N. B. Mandayam, I. Seskar, and S. Kompella, "Design and Implementation of an Underlay Control Channel for NC-OFDM-Based Networks," in Proceedings of Conference on Information Sciences and Systems (CISS 2016), Princeton NJ, March 2016
36. M. Hajimirsadeghi, G. Sridharan, W. Saad, and N. B. Mandayam, "Inter-Network Dynamic Spectrum Allocation Via a Colonel Blotto Game," in Proceedings of Conference on Information Sciences and Systems (CISS 2016), Princeton NJ, March 2016
37. A. A. A. Abass, M. Hajimirsadeghi, N. B. Mandayam, and Z. Gajic, "Evolutionary Game Theoretic Analysis of Distributed Denial of Service Attacks in a Wireless Network," in Proceedings of Conference on Information Sciences and Systems (CISS 2016), Princeton NJ, March 2016
38. M. Hajimirsadeghi, N. B. Mandayam, and A. Reznik, "Joint Caching and Pricing Strategies in Information Centric Networks," in Proceedings of IEEE Global Communications Conference (Globecom), San Diego, CA, December 2015
39. S. Pattar, N. B. Mandayam, I. Seskar, J. Chen, and Z. Li, "Rate Optimal Backhaul and Distribution using LTE in TVWS," in Society of Cable Telecommunications Engineers (SCTE) Cable-Tec Symposium, New Orleans, LA, October 2015
40. R. Kumbhkar, T. Kuber. G. Sridharan, N. B. Mandayam, and I. Seskar, "Rate Optimal Design of a Backhaul Network using TV White Space," in Proceedings of IEEE Dynamic Spectrum Access Networks (DySPAN), Stockholm, Sweden, October 2015
41. S. Anand, O. Arazy, N. B. Mandayam, and O. Nov, "Game Theoretic Modeling of Online Knowledge Creation in Wikipedia," *Information Theory and Applications (ITA) Workshop*, San Diego, CA, February 2015
42. R. Kumbhkar, M. N. Islam, N. B. Mandayam, and I. Seskar, "Rate Optimal Design of a Backhaul Network using TV White Space," in Proceedings of IEEE/ACM International Conference on Communications Systems and Networks (COMSNETS), Bangalore, India, January 2015

43. L. Xiao, J. Liu, Y. Li, N. B. Mandayam, and H.V. Poor, "Prospect Theoretic Analysis of Anti-Jamming Communications in Cognitive Radio Networks," in Proceedings of IEEE Globecom, Austin, TX, December 2014
44. Y. Yang and N. B. Mandayam, "Impact of End-User Decisions on Pricing in Wireless Networks under a Multiple-User-Single-Provider Setting," in Proceedings of the 52nd Annual Allerton Conf. on Commun. Control and Computing, Allerton, IL, Oct. 2014
45. A. Ashok, V. Nguyen, M. Gruteser, N. B. Mandayam, W. Yuan, K. Dana, "Do Not Share! Invisible Light Beacons for Signaling Preferences to Privacy-Respecting Cameras," in Proceedings of ACM Mobicom Workshop on Visible Light Communications Systems, Maui, HI, September 2014
46. S. Mukherjee, K. Su, N. B. Mandayam, K. K. Ramakrishnan, D. Raychaudhuri and I. Seskar, "Evaluating opportunistic delivery of large content with TCP over WiFi in I2V communication" in Proceedings of IEEE International Workshop on Local & Metropolitan Area Networks (LANMAN), Reno, NV, May 2014
47. Y. Wang, W. Saad, N. Mandayam, and H. V. Poor, "Integrating Energy Storage into the Smart Grid: A Prospect Theoretic Approach," in Proceedings of the 39th IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), Florence, Italy, May 2014
48. M. N. Islam, A. Sampath, A. Maharshi, O. Koymen and N. B. Mandayam, "Wireless Backhaul Node Placement for Small Cell Networks," in Proceedings of Conference on Information Sciences and Systems (CISS 2014), Princeton NJ, March 2014
49. Y. Yang and N. B. Mandayam, "Impact of End-User Decisions on Pricing in Wireless Networks," in Proceedings of Conference on Information Sciences and Systems (CISS 2014), Princeton NJ, March 2014
50. S. Anand, O. Arazy, N. B. Mandayam and O. Nov, "A Game Theoretic Analysis of Collaboration in Wikipedia," in Proceedings of the 4th International Conference on Decision and Game Theory for Security (GameSec 2013), Fort Worth TX, November 2013
51. T. Nishio, R. Shinkuma, T. Takahashi, N. B. Mandayam, "Service-Oriented Heterogeneous Resource Sharing for Optimizing Service Latency in Mobile Cloud," in Proceedings of the First International Workshop on Mobile Cloud Computing and Networking (ACM Mobile Cloud'13), MobiHoc 2013, Bangalore, India, July 2013
52. A. Ashok, C.Xu, T.Vu, M. Gruteser, Y.Zhang, R.Howard, N. B. Mandayam, W. Yuan, K. Dana, "Demo: BiFocus - Using Radio-Optical Beacons for An Augmented Reality Search Application," in Proceedings of ACM/USENIX International Conference on Mobile Systems, Applications, and Services (MobiSys), Taipei, Taiwan, June 2013
53. W. Yuan, K. Dana, A. Ashok, M. Varga, M. Gruteser, N. B. Mandayam, "Photometric Modeling for Active Scenes," in Proceedings of IEEE Conference of Computer Vision and Pattern Recognition (CVPR) Workshop on Computational Cameras and Displays, Portland, OR, June 2013
54. M. N. Islam, S. Balasubramaniam, N. B. Mandayam, I. Seskar, S. Kompella, "Implementation of Distributed Time Exchange Based Cooperative Forwarding," in Proceedings of the 2012 Military Communications Conference (MILCOM 2012), Orlando, FL, October/November 2012, pp. 1-6
55. N. Krishnan, R. D. Yates, N. B. Mandayam, "Cellular Systems with Many Antennas: Large System Analysis under Pilot Contamination," in Proceedings of the 50th Annual Allerton Conf. on Commun. Control and Computing, Allerton, IL, Oct. 2012
56. D. Zhang, K. Su, N. B. Mandayam, "Network Coding Aware Resource Allocation to Improve Throughput," in Proceedings of IEEE International Symposium on Information Theory (ISIT), Cambridge, MA, July 2012
57. M. N. Islam, N. B. Mandayam, S. Kompella, "Optimal Resource Allocation and Relay Selection in Bandwidth Exchange Based Cooperative Forwarding," in Proceedings of the 10th International Symposium on Modeling and Optimization in Mobile, Ad Hoc and Wireless Networks (WiOpt 2012), Paderborn, Germany, pp. 192-199, May 2012

58. T. Li and N. B. Mandayam, "Prospects in a Wireless Random Access Game," in Proceedings of Conference on Information Sciences and Systems (CISS 2012), Princeton NJ, March 2012
59. K. Su, D. Zhang, and N. B. Mandayam, "Network Coding Aware Power Control in Wireless Networks," in Proceedings of Conference on Information Sciences and Systems (CISS 2012), Princeton NJ, March 2012
60. W. Yuan, K. Dana, A. Ashok, M. Varga, M. Gruteser, N. B. Mandayam, "Dynamic and Invisible Messaging for Visual MIMO," in Proceedings of the IEEE Workshop on the Applications of Computer Vision (WACV), pp. 345-352, 2012, Breckenridge, CO, January 2012
61. T. Nishio, R. Shinkuma, T. Takahashi, N. B. Mandayam, "A Heuristic Solution for N-node Bandwidth Barter Mechanism," in Proceedings of the IEEE Consumer Communications and Networking Conference (CCNC) 2012, Las Vegas, NV, January 2012
62. S. Mathur, R. Miller, A. Varshavsky, W. Trappe, N. B. Mandayam, "ProxiMate: Proximity-Based Secure Pairing Using Ambient Wireless Signals," in Proceedings of the 9th International Conference on Mobile Systems, Applications, and Services, Washington, DC, July 2011, pp. 211-224.
63. M. Varga, A. Ashok, M. Gruteser, N. B. Mandayam, W. Yuan, K. Dana, "Demo: Visual MIMO-based LED-Camera Communication Applied to Automobile Safety," in Proceedings of ACM/USENIX International Conference on Mobile Systems, Applications, and Services (MobiSys), pp. 383-384, Washington DC, June 2011
64. T. Nishio, R. Shinkuma, T. Takahashi, N. B. Mandayam, "TXOP Exchange: A Cooperation Mechanism for Wireless Access Networks," in Proceedings of the 2011 IEEE Communications Quality and Reliability (CQR) International Workshop, Naples, FL, May 2011, pp. 1-6.
65. W. Yuan, K. Dana, M. Varga, A. Ashok, M. Gruteser, N. B. Mandayam, "Computer Vision Methods for Visual MIMO Optical System," in Proceedings of the IEEE International Workshop on Projector-Camera Systems (held with CVPR), pp. 37-43, Colorado Springs, CO, June 2011
66. A. Ashok, M. Gruteser, N.B. Mandayam, T. Kwon, W. Yuan, M. Varga, K. Dana, "Rate Adaptation in Visual MIMO," in Proceedings of IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), pp. 583-591, Salt Lake City, UT, June 2011
67. T. Li, N. B. Mandayam, A. Reznik, "Distributed Algorithms for Joint Channel and RAT Allocation in a Cognitive Digital Home" in Proceedings of IEEE WIOPT'11, Princeton, NJ, May 2011.
68. D. Zhang, N. B. Mandayam, "Bandwidth Exchange for Fair Secondary Coexistence in TV White Space," in Proceedings of International ICST Conference on Game Theory for Networks (GameNets), Shanghai, April 2011.
69. D. Zhang and N. B. Mandayam, "Resource Allocation for Multicast in an OFDMA Network with Random Network Coding," in Proceedings of IEEE International Conference on Computer Communications (INFOCOM), Shanghai, April 2011.
70. A. Ashok, M. Gruteser, N. B. Mandayam, K. Dana, "Characterizing Multiplexing and Diversity in Visual MIMO," in Proceedings of Conference on Information Sciences and Systems (CISS 2011) March 2011, Baltimore, MD.
71. T. Li, N. B. Mandayam, A. Reznik, "A Framework for Resource Allocation in a Cognitive Digital Home" in Proceedings of IEEE Globecom, Miami, FL, December 2010.
72. C. Gerami, N. B. Mandayam, L. J. Greenstein, "Backhauling in TV White Space" in Proceedings of IEEE Globecom, Miami, FL, December 2010.
73. D. Zhang, L. Dong, N. B. Mandayam, "Sensing Wireless Microphone with ESPRIT from Noise and Adjacent Channel Interference," in Proceedings of IEEE Globecom, Miami, FL, December 2010.
74. L. Xiao, A. Reznik, W. Trappe, C. Ye, Y. Shah, L. J. Greenstein, N. B. Mandayam, "PHY-Authentication Protocol for Spoofing Detection in Wireless Networks" in Proceedings of IEEE Globecom, Miami, FL, December 2010.

75. N. Krishnan, J. S. Panchal, N. B. Mandayam, R. D. Yates, "Bandwidth Sharing in LTE-A systems," in Proceedings of the 48th Annual Allerton Conf. on Commun. Control and Computing, Allerton, IL, Oct. 2010.
76. A. Ashok, M. Gruteser, N. Mandayam, J. Silva, M. Varga, and K. Dana, "Challenge: Mobile Optical Networks Through Visual MIMO," in MobiCom: Proceedings of the sixteenth annual international conference on Mobile computing and networking, Chicago, IL: ACM, pp. 105-112, 2010.
77. D. Zhang, N. B. Mandayam, "Analyzing Multiple Flows in a Wireless Network using Differential Equations and Differential Inclusions" in Proceedings of 2010 IEEE Wireless Network Coding (WiNC) Workshop, Boston, MA, June 2010
78. D. Zhang, N. B. Mandayam, S. Parekh, "DEDI: A Framework for Analyzing Rank Evolution of Random Network Coding in a Wireless Network" in Proceedings of IEEE International Symposium on Information Theory (ISIT), Austin, TX, June 2010
79. C. Raman, G. Foschini, R. Valenzuela, R. Yates, N. B. Mandayam, "Relaying in Downlink Cellular Systems" in Proceedings of Conference on Information Sciences and Systems (CISS 2010) March 2010, Princeton NJ
80. C. Raman, G. Foschini, R. Valenzuela, R. Yates, N. B. Mandayam, "Power Savings from Half-Duplex Relaying in Downlink Cellular Systems" in Proceedings of Annual Allerton Conference on Communication, Control, and Computing, September 2009 Allerton, IL
81. D. Zhang, R. Shinkuma, N. B. Mandayam, "Bandwidth Exchange for Enabling Forwarding in Wireless Access Networks" in Proceedings of IEEE PIMRC, September 2009, Tokyo, Japan
82. C. Comaniciu, N. B. Mandayam, H. V. Poor, "Radio Resource Management in Green Wireless Networks" in Proceedings of IEEE VTC' 2009-Fall, September 2009, Anchorage, AL
83. S. Mathur, W. Trappe, N. B. Mandayam, C. Ye, A. Reznik, "Radio-telepathy: Extracting a Secret Key from an Unauthenticated Wireless Channel" in Proceedings of ACM Mobicom, September 2008, San Francisco CA
84. L. Xiao, L. J. Greenstein, N. B. Mandayam and W. Trappe, "A Physical Layer Technique to Enhance Authentication for Mobile Terminals" in Proceedings of IEEE International Conference on Communications (ICC 2008) May 2008, Beijing, China
85. H. Nama, N. B. Mandayam, R. D. Yates, "Network Formation among Selfish Energy-Constrained Wireless Devices" Proceedings of IEEE INFOCOM, April 2008, Phoenix, AZ
86. D. Zhang, N. B. Mandayam "Bandwidth Exchange as an Incentive for Relaying in Wireless Networks" in Proceedings of Conference on Information Sciences and Systems (CISS 2008) March 2008, Princeton NJ
87. L. Xiao, L. J. Greenstein, N. B. Mandayam and W. Trappe, "MIMO-Assisted Channel-Based Authentication in Wireless Networks" in Proceedings of Conference on Information Sciences and Systems (CISS 2008) March 2008, Princeton NJ
88. S. Mathur, L. Sankar, N. B. Mandayam "Coalitional Games in Cooperative Networks" Information Theory and Applications Workshop, January 2008, San Diego, CA
89. C. Raman, J. Kalyanam, I. Seskar and N. B. Mandayam, "Distributed Spatio-Temporal Sensing: An Experimental Study" Proceedings of the 41st Annual Asilomar Conference on Signals, Systems and Computers, November 2007, Pacific Grove CA
90. L. Sankar, G. Kramer, N. B. Mandayam, "Relay vs. User Cooperation in Multiaccess Networks" in Proceedings of 45th Allerton Conference on Communications, Computing and Control, September 2007, Allerton, IL
91. L. Sankar, Y. Liang, H. V. Poor, N. B. Mandayam, "Opportunistic Communications in an Orthogonal Multiaccess Relay Channel" in Proceedings of the International Symposium on Information Theory (ISIT 2007), June 2007, Nice, France
92. L. Xiao, L. J. Greenstein, N. B. Mandayam and W. Trappe, "Fingerprints in the Ether: Using the Physical Layer for Wireless Authentication" in Proceedings of IEEE International Conference on Communications (ICC 2007) June 2007, Glasgow, Scotland

93. O. Ileri, D. Samardzija, N. B. Mandayam, "Dynamic Property Rights Spectrum Access: Flexible Ownership Based Spectrum Management" in Proceedings of IEEE DySpan 2007, April 2007, Dublin, Ireland
94. S. Mathur, L. Sankaranarayanan, N. B. Mandayam "Coalitional Games in Cooperative Radio Networks" Proceedings of the 40th Annual Asilomar Conference on Signals, Systems and Computers, November 2006, Pacific Grove CA
95. J. Singh, C. Raman, R. D. Yates and N. B. Mandayam, "Random Access for Variable Rate Links" in Proceedings of the 2006 Military Communications Conference (MILCOM), October 2006, Washington D.C.
96. L. Xiao, L. J. Greenstein, N. B. Mandayam "Sensor Networks for Estimating and Updating the Performance of Cellular Systems" in Proceedings of IEEE International Conference on Communications (ICC 2006) June 2006, Istanbul, Turkey
97. H. Nama, M. Chiang, N. B. Mandayam "Optimal Utility-Lifetime Tradeoff in Self-Regulating Wireless Sensor Networks: A Cross-Layer Design Approach" in Proceedings of IEEE International Conference on Communications (ICC 2006) June 2006, Istanbul, Turkey
98. R. D. Yates, C. Raman, N. B. Mandayam "Fair and Efficient Scheduling of Variable Rate Links via a Spectrum Server" in Proceedings of IEEE International Conference on Communications (ICC 2006) June 2006, Istanbul, Turkey
99. G. Rajappan, J. Acharya, H. Liu, N. B. Mandayam, I. Seskar and R. D. Yates, "Mobile Information Network Technology" in Proceedings of the Wireless Sensing and Processing Symposium, SPIE Defense and Security Symposium, April 2006, Kissimmee, FL
100. H. Nama, M. Chiang, N. B. Mandayam "Optimal Utility-Lifetime Tradeoff in Self-Regulating Wireless Sensor Networks: A Distributed Approach" in Proceedings of Conference on Information Sciences and Systems (CISS 2006) March 2006, Princeton NJ
101. S. Mathur, L. Sankaranarayanan, N. B. Mandayam "Coalitional Games in Receiver Cooperation for Spectrum Sharing" in Proceedings of Conference on Information Sciences and Systems (CISS 2006) March 2006, Princeton NJ
102. C. Raman, R. Yates, N. B. Mandayam, "Cross-Layer Scheduling of End-to-End Flows Using a Spectrum Server" in Proceedings of Conference on Information Sciences and Systems (CISS 2006) March 2006, Princeton NJ
103. D. Samardzija, L. Xiao, N. B. Mandayam, "Impact of Pilot Assisted Channel State Estimation on Multiple Antenna Multiuser TDD Systems with Spatial Filtering" in Proceedings of Conference on Information Sciences and Systems (CISS 2006) March 2006, Princeton NJ
104. S. Mathur, L. Sankaranarayanan, N. B. Mandayam "Coalitional Games in Gaussian Interference Channels" Proceedings of the International Symposium on Information Theory (ISIT 2006), July 2006, Seattle WA
105. O. Ileri, D. Samardzija, T. Sizer, N. B. Mandayam, "Demand Responsive Pricing and Competitive Spectrum Allocation via a Spectrum Server" in Proceedings of IEEE DySpan 2005, November 2005, Baltimore, MD
106. C. Raman, R. Yates, N. B. Mandayam, "Scheduling Variable Rate Links via a Spectrum Server" in *Proceedings of IEEE DySpan 2005*, November 2005, Baltimore, MD
107. L. Sankaranarayanan, G. Kramer, N. B. Mandayam, "Cooperation Diversity in Wireless Networks: A Geometry Inclusive Analysis" in Proceedings of 43rd Allerton Conference on Communications, Computing and Control, September 2005, Allerton, IL
108. L. Sankaranarayanan, G. Kramer, N. B. Mandayam, "Cooperation vs. Hierarchy: An Information Theoretic Comparison" in *Proceedings of 2005 IEEE International Symposium on Information Theory*, September 2005, Adelaide, Australia
109. H. Nama, N.B. Mandayam, "Sensor Networks over Information Fields: Optimal Energy and Node Distributions" in Proceedings of WCNC'2005, March 2005, New Orleans, LA
110. D. Samardzija, N.B. Mandayam, "Unquantized Uncoded Channel State Feedback in Multiple Antenna Multiuser Systems" in Proceedings of WCNC'2005, March 2005, New Orleans, LA

111. F. Meshkati, M. Chiang, H. V. Poor, S. C. Schwartz, N.B. Mandayam, "A non-cooperative power control game for multi-carrier CDMA systems" in Proceedings of WCNC'2005, vol. 1, pp. 606-611, March 2005, New Orleans, LA
112. H. Liu, L. Razoumov, N.B. Mandayam, "Optimal Power Allocation for Type-II Hybrid ARQ via Geometric Programming", in Proceedings of CISS, The Johns Hopkins University, Baltimore, MD, March 2005
113. L. Sankaranarayanan, G. Kramer, N. B. Mandayam, "Hierarchical Wireless Networks: Capacity theorems using the constrained multiple-access relay channel model" in 38th Annual Asilomar Conf. Signals, Systems, and Computers, November 2004, Pacific Grove CA
114. L. Sankaranarayanan, G. Kramer, N. B. Mandayam, "Hierarchical Sensor Networks: Capacity theorems and cooperative strategies using the multiple-access relay channel model" in First IEEE Conference on Sensor and Ad Hoc Communications and Networks, October 2004, Santa Clara CA
115. L. Sankaranarayanan, G. Kramer, N. B. Mandayam, "Capacity theorems for the multiple-access relay channel" in 42nd Annual Allerton Conf. on Commun., Control, and Computing, September 2004, Allerton, IL
116. F. Meshkati, D. Guo, H. V. Poor, S. C. Schwartz, N.B. Mandayam, "A Unified Approach to Power Control for Multiuser Detectors" in 2nd International Workshop on Signal Processing for Wireless Communications, June 2004, London, U.K.
117. D. Samardzija, N. B. Mandayam, "Uncoded Unquantized CSI Feedback in Correlated Wireless Channels" in CISS'2004, March 2004, Princeton NJ
118. D. Samardzija, D. Chizhik, N. B. Mandayam "Downlink Multiple Antenna Transmitter Optimization on Spatially and Temporally Correlated Channels with Delayed Channel State Information" in CISS'2004, March 2004, Princeton NJ
119. O. Ilieri, S. Mau, N. B. Mandayam "Pricing for Enabling Forwarding in Wireless Adhoc Networks" in Proceedings of WCNC'2004, March 2004, Atlanta, GA
120. D. Samardzija, N. B. Mandayam, "Downlink Transmitter Optimization Schemes for Multiple Antenna Systems" in IEEE VTC'03 (Fall), Orlando, FL, October, 2003
121. F. Meshkati, H. V. Poor, S. Schwartz, N. Mandayam "A Game Theoretic Approach to Power Control and Receiver Design in Wireless Data Networks with Multiple Antennas" in *Proceedings of 41st Annual Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September, 2003
122. F. Meshkati, H. V. Poor, S. Schwartz, N. Mandayam "Linear Multiuser Receivers and Power Control: A Game Theoretic Approach" in Proceedings of CISS'2003, Johns Hopkins University, Baltimore, MD, March, 2003
123. D. Samardzija, N. B. Mandayam, "Pilot Assisted MIMO Channel Estimation and Achievable Rates" in DIMACS Workshop on Signal Processing for Wireless Transmission, October 2002, NJ (Invited Paper)
124. A. Domazetovic, L. Greenstein, N. Mandayam, I. Seskar "A New Modelling Approach for Wireless Channels with Predictable Path Geometries" in IEEE VTC'02 Fall, September 2002, Vancouver, Canada
125. H. Wang, N. B. Mandayam "Opportunistic Transmission for Wireless Data under Energy and Delay Constraints" in IEEE International Symposium on Advances in Wireless Communications (ISWC'02), September 2002, Victoria, British Columbia, Canada (Invited Paper)
126. H. Wang, N. B. Mandayam "A Simple Packet Scheduling Scheme for Wireless Data over Fading Channels", in CISS'2002, Princeton, NJ, March, 2002
127. S. Mau, N. Feng, N. B. Mandayam "Pricing and Power Control for Joint User-centric and Network-centric Resource Allocation" in CISS'2002, Princeton, NJ, March, 2002
128. C. Comaniciu, N. B. Mandayam "Integrated Access Control and Multiuser Detection for CDMA Systems" in CISS'2002, Princeton, NJ, March, 2002

129. D. Samardzija, N. B. Mandayam, "Estimation of Fading Channel Response and System Capacity Considerations" in CISS'2002, Princeton, NJ, March, 2002
130. H. Wang, N. B. Mandayam "Energy Constrained Power Control" in *Proceedings of GLOBE-COM 2001*, San Antonio, TX, November 2001
131. H. Wang, N. B. Mandayam "Energy and Delay Constrained Power Control for File Transfers over fading Channels" in *Proceedings of Asilomar*, Monterey, CA, , November 2001
132. S. Mau, N. Feng, N. B. Mandayam "Pricing and Power Control for Joint User-centric and Network-centric Resource Allocation" in *Proceedings of 39th Annual Allerton Conference on Communication, Control, and Computing*, Allerton, IL, September, 2001
133. S. Mau, N. Feng, N.B. Mandayam "Pricing Resources for Utility Maximization in the Context of Capacity Region Per Unit Cost" in *Proceedings of IEEE International Symposium on Information Theory*, Washington D.C., June 2001
134. D. J. Goodman, N. B. Mandayam, "Network Assisted Power Control for Wireless Data ", in *Proceedings of VTC 2001*, Greece, Spring 2001
135. D. Samardzija, N. B. Mandayam "Multistage Blind Interference Cancellation and Channel Estimation for DS-CDMA Systems" in CISS'2001, Johns Hopkins University, Baltimore, MD, March, 2001
136. C. Comaniciu, N. B. Mandayam, D. Famolari and P. Agrawal "QoS Guarantees for Third Generation (3G) CDMA Systems via Admission and Flow Control" in VTC'2000 (Fall), Boston, MA, September 2000
137. D. Samardzija, N. B. Mandayam, I. Seskar "Blind Successive Interference Cancellation" in VTC'2000 (Fall), Boston, MA, September 2000
138. 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
139. 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
140. 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
141. H. Wang, N. B. Mandayam "Dynamic Utility Maximization for Mobile Data Communications under Delay Constraints" in VTC'2000 (Spring), Tokyo, Japan, May 2000
142. L. Song, N. B. Mandayam "Hierarchical SIR and Rate Control for CDMA Data Users", in CISS'2000, Princeton, NJ, March, 2000
143. D. Samardzija, N. B. Mandayam, I. Seskar "Blind Interference Cancellation for the CDMA Downlink" in CISS'2000, Princeton, NJ, March, 2000
144. 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
145. 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
146. 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
147. 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
148. 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

149. 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
150. 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
151. 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
152. 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
153. 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
154. 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
155. 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
156. 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
157. 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
158. 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
159. I. Seskar, N.B. Mandayam "Reconfigurable Testbed for Linear Multiuser Detection", in *Proceedings of International Conference on Telecommunications (ICT'98)*, Chalkidiki, Greece, June, 1998
160. 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.
161. 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
162. 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
163. 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
164. 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

165. 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
166. 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
167. 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
168. 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
169. 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
170. 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
171. 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
172. 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
173. 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
174. 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
175. 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
176. 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
177. 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
178. 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
179. 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
180. 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
181. 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

182. 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
183. 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
184. 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
185. 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
186. 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
187. 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
188. 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
189. 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
190. 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
191. 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.
192. 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.
193. 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.
194. B. Chakravarty, N.B. Mandayam, S. Mukhopadhyay, A. Patra, G.P. Rao, "Real-Time Parameter Estimation via Block Pulse Functions", In *28th Annual Conference of the Society of Instrument and Control Engineers (SICE)*, Matsuyama, Japan, pp. 1095-1098, July 1989.

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. Alireza Nooraiepour, Ph.D. December 2022, Thesis: “Learning-Aided Physical Layer Security for IoT” (currently at Qualcomm) (co-advisor with W. Bajwa)
 2. Sijie Xiong, Ph.D. December 2021, Thesis: “PERMIT: Privacy-Enabled Resource Management for Internet of Things Networks” (currently at Amazon) (Co-advisor: Anand Sarwate)
 3. Mohsen Rajabpour, Ph.D. December 2021, Thesis: “Modeling Prosumer Behavior in the Smart Grid and Implementing Privacy Design in IoT” (currently at Kryptowire) (Co-advisor: Anand Sarwate)
 4. Mohammad Yousefvand, Ph.D. February 2021, Thesis: “User Centric and Network Centric Approaches for Resources and Emergency Alert Optimization in Wireless Networks” (currently at Qualcomm)
 5. Tejashri Kuber, Ph.D. November 2020, Thesis: “Learning and Prediction using Radio and Non-Radio Attributes in Wireless Systems” (currently at Dell)
 6. Neelakantan Nurani Krishnan, Ph.D. November 2019, Thesis: “Pushing the Envelope of Wi-Fi Networks Using Distributed Multi-user MIMO” (currently at Qualcomm)
 7. Mohammad Hajimirsadeghi, Ph.D. September 2018, Thesis: “Game Theoretic Approaches for Design of Information Centric Networks (ICN) and Spectrum Sharing” (currently at Princeton University)
 8. Ahmed Alabdel A. Abass, Ph.D. May 2018, Thesis: “Evolutionary Games: Applications to Security and Resource Allocation” (currently at University of Thi-Qar, Iraq)
 9. Ratnesh Kumbhkar, Ph.D. December 2017, Thesis: “Opportunistic Access of Noncontiguous Spectrum - Exploring use of Noncontiguous OFDM transmission for Dynamic Spectrum Access” (currently at Intel)
 10. 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)
 11. Wenjia Yuan, Ph.D. September 2014, Thesis: “Computational Photography Methods for Visual MIMO” (currently at Google) (Co-advisors: K. Dana and M. Gruteser)
 12. Muhammad Nazmul Islam, Ph.D. September 2014, Thesis: “Noncontiguous Spectrum Access and Small Cell Network Design” (currently at Qualcomm)
 13. Ashwin Ashok, Ph.D. June 2014, Thesis: “Design, Modeling and Analysis of Visual MIMO Communication” (currently at CMU) (Co-advisor: M. Gruteser, K. Dana)
 14. Narayanan Krishnan, Ph.D. September 2013, Thesis: “Bandwidth Sharing and Massive MIMO for Next Generation Cellular Systems” (currently at Qualcomm) (Co-advisor: R. Yates)
 15. Tianming Li, Ph.D. September 2013, Thesis: “Cognitive Radio Networks: Resource Allocation and Effect of End-User Behavior” (currently at J. P. Morgan)
 16. Dan Zhang, Ph.D. September 2012, Thesis: “On the Dynamics of Random Network Coding” (currently at Qualcomm)
 17. 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)
 18. 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)
 19. 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)

20. Zhuyu Lei, Ph.D. December 2008, Thesis: "Utility-based Power Control for Packet-Switched Wireless Networks" (currently at Alcatel-Lucent, IL)
 21. 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)
 22. 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))
 23. 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)
 24. Hitesh Nama, Ph.D. February 2007, Thesis: "Resource Allocation in Cooperative and Non-cooperative Energy-constrained Wireless Networks" (currently at Marvel Semiconductor)
 25. Salim Manji, Ph.D. September 2004, Thesis: "Rate Adaptation Strategies for Progressive Image Transmission over Fading Channels" (currently at Spirent Technologies, NJ)
 26. Nan Feng, Ph.D. July 2004, Thesis: "User Centric and Network Centric Radio Resource Management" (currently at Alcatel-Lucent Technologies, NJ)
 27. Dragan Samardzija, Ph.D. April 2004, Thesis: "Multiple Antenna Wireless Systems and Channel State Information" (currently at Bell Labs, Alcatel-Lucent Technologies, NJ)
 28. Heng Wang, Ph.D. December 2002, Thesis: "Opportunistic Transmission for Wireless Data over Fading Channels under Energy and Delay Constraints" (currently at Qualcomm)
 29. 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)
 30. Jie Lai, Ph.D., August 2001, Thesis: "Performance of Channel Coding on Temporally and Spatially Correlated Wireless Channels" (currently at Broadcom Inc.)
 31. Lei Song, Ph.D., August 2001, Thesis: "Resource Allocation Based on Hierarchical and Nonlinear Control in Wireless Networks" (currently at UTStar Telecom Inc.)
 32. 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 Ibiquity 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. Nitya Sathyavageswaran, Ph.D. Thesis: Privacy and Age of Information (co-advisor with A. Sarwate and R. Yates)
2. Zahra Aref, Ph.D. Thesis: Advanced Persistent Threats and End-User Behavior
3. Demetrios Lambropoulos, Ph.D. Thesis: Impact of End-User Behavior and Non Radio Attributes on Resource Allocation
4. Hariharan Venkat, Ph.D. Thesis: Secure Directional Modulation and Multiple Access (co-advisor with W. Bajwa, C. Wu)
5. Sreeram Mandava, M.S./Ph.D. Thesis: 5G-SAT Spectrum Coexistence
6. Anurag Bambardekar, M.S./Ph.D. Thesis: ML based Spectrum Sharing 5G O-RAN
7. Emir Accilien, Ph.D. Thesis: 5G-SAT FR3 Spectrum Testbed
8. Zhuohuan Li, Ph.D. Thesis: Energy Efficient O-RAN Design and Testing
9. Prasanti Maddala, Ph.D. Thesis: Massive MIMO Beam Steering and FPGA Implementation
10. John-David Oyedum, Ph.D Thesis: TBD (co-advisor with Y. Chen)
11. Minhajur Rahman, Ph.D Thesis: TBD (co-advisor with Y. Chen)
12. Sabarinath Ramachandran, M.S. Thesis: 6G OTFS Implementation
13. Behzad Golparvar, Ph.D. (primary advisor: R. Qian, CEE)
14. David Bazzett, Ph.D. (primary advisor: R. Qian, CEE)

UNDERGRADUATE RESEARCH INITIATIVES:

1. “Stock Trading Bot,” 2022-2023. In this project, students are designing and prototyping a stock trading bot using APIs for market trading, portfolio analysis and machine learning with real time and historical data. (Students: Beaman Negash, Joseph Barr, David Valverde, Avery Turnbull, Adideb Nag)
2. “NFC & Blockchain Based Digital Authentication,” 2021-2022. In this project, students designed and prototyped a mechanism for giving real life objects a digital identity. (Students: Aryan Bindroo, Pavan Kalyan Reddy Meka, Sriram Kannan, Rohan Ravella)
3. “Eagle Eye – Multi UAV Reconnaissance,” 2019-2020. In this project, students designed and prototyped a multi UAV reconnaissance system for search and rescue operations when communications infrastructure is compromised. (Students: Kaavya Krishna-Kumar, Sagar Shah, Harmit Badyal, Abhishek Kondila)

4. "Tracking Rutgers Students for Traffic Optimization," 2014-2015. 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)
5. "Resonance based Wireless Power Transfer." 2013. In this project, students designed a prototype device for remotely charging cell phones. (Students: Hiren Patel, Parth Patel, Nikunj Shah)
6. "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)
7. "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)
8. "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)
9. "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: Suhrid Bhatt, Smeet Modi, Jigar Pathak, Lakshmi Murthy)
10. "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)
11. "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.
12. "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)
13. "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)
14. "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)
15. "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)

16. "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)
17. "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. "Wireless Revolution: Forces and Strategies that shaped the 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. Has been offered in Flip'd mode since 2020.
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. "Wireless Revolution" - Spring 2023, 2022, 2021, 2020, 2019, 2018, 2017; 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. University Network Infrastructure Steering Committee, 2020-21
2. School of Engineering, Distinguished Professor Promotion Committee, 2015-16
3. ECE Department Strategic Planning Committee, Rutgers University, 2006-present
4. ECE Undergraduate Curriculum Revision Committee, 2012-present
5. Member, Committee on Corporate Partnerships, Office of VP of Research and Economic Development, 2011-12
6. Chair, ECE Chair Search Committee, Rutgers University 2009-10
7. ECE Faculty Search Committee, Rutgers University 2006-2012
8. School of Engineering Academic Promotion and Tenure Committee, Rutgers University - 2007-2008, 2008-2009, 2022-23
9. Faculty Advisor, IEEE Student Branch, Rutgers University, Jan. 1997-December 2002
10. Engineering Orientation Lecture, Rutgers University - November 1996, November 1997, November 1998, December 2001, February 2002, Spring 2009, Fall 2012, Spring 2013,
11. Engineering Open House (led one ECE Department "Info-session" almost every year for the last several years)
12. Undergraduate and Graduate Student Advising
13. Graduate Committees: Scholastic Standing Committee, Graduate Admissions Committee
14. Undergraduate Committees: Scholastic Standing Committee
15. 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)

Narayan B. Mandayam
(Recent Cases Involved as Expert)

1. *Four Batons v. Samsung (ongoing)*

Expert for Samsung, with law firm Arnold & Porter Kaye Scholer LLP. My expertise involves wireless network security and authentication

2. *Apex Beam Technologies LLC v. Apple Inc. (ongoing)*

Expert for Apple, with law firm Fish & Richardson. My expertise involves 5G systems, protocols, architecture and standards

3. *XR Communications, LLC, dba Vivato Technologies v. Apple Inc. (Case No. 6:21-cv-00620-AD) (settled in 2023)*

Expert for Apple, with law firm Goldman Ismail Tomaselli Brennan & Baum. My expertise involved 5G systems and standards with focus on MIMO/OFDM technologies

4. *Ericsson v. Apple Inc. (IPR Petition filed in 2022, settled in 2022)*

Expert for Apple, with law firm Fish & Richardson, P.C. My expertise involved 5G architecture and networking technologies for security and authentication.

5. *Ericsson v. Samsung (IPR Petition preliminary work, settled in 2021)*

Expert for SAMSUNG, with law firm Fish & Richardson, P.C. My expertise involved 4G, LTE and 5G architecture and networking technologies

6. *Square v. SendSig (IPR Petition Filed, settled in 2020)*

Expert for Square, with law firm Maynard, Cooper and Gale, LLP. My expertise involved a range of issues related to multimedia data transmission and messaging.

7. *Qualcomm v. Apple (IPR2018-01279)*

Expert for Apple, with law firm Fish and Richardson, P.C. My expertise involved a range of issues related to wireless data and messaging. Deposition.

8. *Huawei v. Samsung (IPR2017-01487)*

Expert for Huawei, with law firm Sidley Austin, LLP. My expertise involved a range of issues related to 4G wireless standards, Non Access Stratum, Security. Deposition.

9. *Nokia v. Huawei (2 IPR cases, settled)*

Expert for Huawei, with law firm Fish and Richardson, P.C. My expertise involved a range of issues related to 4G wireless standards, Security, Handovers

10. ***Huawei v. Nokia (3 IPR cases, settled)***

Expert for Huawei, with law firm Fish and Richardson, P.C. My expertise involved a range of issues related to 4G wireless standards, PHY/MAC.

11. ***IXI Patent Reexam***

Expert for IXI for Reexam of a patent on managing a wireless LAN network using short range radio signals, with law firm Brooks Kushman, P.C.

12. ***IXI v. Samsung, Apple (5 Cases No. IPR2015-01442, IPR2015-01443, IPR2015-01444, IPR2015-01445, IPR2015-01446)***

Expert for IXI, with law firm Pepper Hamilton, LLP. My expertise involved remote management of a Wireless LAN Network such as Bluetooth, WiFi using a cellular gateway device. 3 Depositions.

13. ***Location Labs v. Locationet Systems (2 Cases No. IPR2014-00199, No. IPR2014-00920)***

Expert for Locationet Systems, with law firm Pepper Hamilton, LLP. My expertise involved location tracking algorithms and the architectural issues in location tracking systems for wireless device location. 2 Depositions.

14. ***Ericsson Inc. v. Samsung Electronics Inc. (6:12-cv-895, settled)***

Expert for SAMSUNG, with law firm Fish & Richardson, P.C. My expertise involved MAC and PHY layer operations, specifically access and control channels used in multi-access wireless systems such as 2G, WCDMA, 3G and LTE.

15. ***Apple Inc. and NeXT Software, Inc. (f/k/a NeXT Computer, Inc.), v. Motorola, Inc. and Motorola Mobility, Inc. (10-cv-662-bbc)***

Expert for Apple, with law firms Covington & Burling, LLP and Weil, Gotshal & Manges, LLP. My expertise involved MAC and PHY layer operations over WLANs, specifically, 802.11 based WiFi protocols as well as paging protocols and message formats used in multi-access wireless systems such as 2G, 3G and LTE. I started as a testifying expert but later became a consulting expert due to consolidation of patents and prepared the expert report on one of the patents involved.