

Wade Trappe

Department of Electrical and Computer Engineering, and
Wireless Information Network Laboratory (WINLAB)
Rutgers, The State University of New Jersey
671 Rt. 1 South, North Brunswick, NJ 08902

Education

- 6/99 – 5/02 **University of Maryland**, College Park, MD
Department of Electrical and Computer Engineering, Institute for Systems Research, and Applied Mathematics and Scientific Computation Program
Ph.D. Applied Mathematics and Scientific Computing
- 8/96 – 5/99 **University of Maryland**, College Park, MD
Department of Electrical and Computer Engineering, Institute for Systems Research, and Applied Mathematics and Scientific Computation Program
M.S. Applied Mathematics and Scientific Computing
- 8/91 – 12/94 **The University of Texas at Austin**, Austin, TX
B.A. Mathematics, with Highest Honors

Professional Experience

- *Associate Director*, Wireless Information Networking Laboratory (WINLAB), Rutgers University 2007-Present.
- *Professor*, Rutgers University. Department of Electrical and Computer Engineering and the Wireless Information Networking Laboratory. 2013-Present.
- *Associate Professor*, Rutgers University. Department of Electrical and Computer Engineering and the Wireless Information Networking Laboratory. 2007-2013.
- *Visiting Fellow*, Princeton University. Department of Electrical Engineering. Fall 2009- Present.
- *Assistant Professor*, Rutgers University. Department of Electrical and Computer Engineering and the Wireless Information Networking Laboratory. 2002-2007.
- *Graduate Research Assistant*, University of Maryland, Department of Electrical and Computer Engineering, and Institute for Systems Research. College Park, MD. 1998-2002.
- *Engineering Intern*, Dialogic Corp. (a subsidiary of Intel), Parsippany, NJ. 1997-1998.
- *Graduate Teaching Assistant*, University of Maryland, Department of Mathematics. College Park, MD. 1998. Co-designed the curriculum for a new cryptography class offered jointly by the math and computer science departments, and co-authored the accompanying textbook.
- *Research Scientist Associate*, Applied Research Laboratories, The University of Texas at Austin, Austin, TX. 1995-1996.
- *Laboratory Research Assistant*, Applied Research Laboratories, The University of Texas at Austin, Austin, TX. 1991-1994.
- *Summer Intern*, 3M, Austin, TX. 1990.

Awards and Honors

- *Best Paper Award* for Shweta Sagari, Samuel Baysting, Dola Saha, Ivan Seskar, Wade Trappe, Dipankar Raychaudhuri, "Coordinated dynamic spectrum management of LTE-U and Wi-Fi networks", in Proceedings of the 2015 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN 2015).
- *Best Paper Award* for Andrey Garnaev, Shweta Sagari and Wade Trappe, "Fair Allocation of Throughput under Harsh Operational Conditions", in Proceedings of the 8th International Workshop on Multiple Access Communications (MACOM 2015).

- *Best Paper Award* for Andrey Garnaev and Wade Trappe, "*Secret Communication when the Eavesdropper Might be an Active Adversary*", in Proceedings of the 7th International Workshop on Multiple Access Communications (MACOM 2014).
- *IEEE Fellow*, recognized "for contributions to information and communication security," 2013.
- *Outstanding Faculty Award*, School of Engineering, Rutgers, The State University of New Jersey, 2013. Awarded to faculty annually to recognize accomplishments of engineering faculty at Rutgers.
- *Distinguished Alumni Award*, University of Maryland Electrical and Computer Engineering Department, 2014.
- *Best Paper Award* for Suhas Mathur, Tong Jin, Nikhil Kasturirangan, Janani Chandrasekharan, Wenzhi Xue, Marco Gruteser, Wade Trappe, "*ParkNet: Drive-by Sensing of Road-side Parking Statistics*", in Proceedings of ACM Mobisys (2010).
- *Best Paper Award* for Aliye Ozge Kaya, Wade Trappe, and Mung Chiang, "*P2P-ISP Cooperation: Risks and Mitigation*", in Proceedings of the IEEE Global Communications Conference (Globecom), Honolulu, Hawaii, December 2009.
- *Best Paper Award* for Song Liu, Yingying Chen, Wade Trappe, Larry J. Greenstein, "*Non-interactive Localization of Cognitive Radios Based on Dynamic Signal Strength Mapping*", in Proceedings of the Sixth International Conference on Wireless On-demand Network Systems and Services (WONS), Snowbird, Utah, February 2009.
- *Best Paper Award*, *IEEE Signal Processing Society*, for "Anti-Collusion Fingerprinting for Multimedia," (awarded at the 2006 ICASSP Conference in Toulouse, France). The SPS Best Paper Award is awarded based upon the impact an article has over a time window of up to 5 years.
- *Best Paper Award*, *Journal of Applied Signal Processing*, for "Group-Oriented Fingerprinting for Multimedia Forensics," (awarded at the EURASIP 2005 Conference in Sept. at Antalya, Turkey). The EURASIP Best Paper Award is awarded to a single journal article from the previous year that is judged by the community to have significant technical merit and impact.
- *George Harhalakis Outstanding Systems Engineering Graduate Student*, University of Maryland, 2002. Awarded to one graduate student per year for entire graduate program at the Institute for Systems Research.
- *Graduate School Fellowship*, University of Maryland, 1996-1998. Awarded to four out of 52 entering mathematics graduate students.
- *Highest Honors*, College of Natural Sciences at The University of Texas at Austin, Fall 1994. Awarded to top 4% of graduating seniors from the college.
- *Dean's Honored Graduate*, Department of Mathematics at The University of Texas at Austin, Fall 1994. Selected as the most outstanding graduating mathematics senior from the Fall 1994 semester.
- *Research Experience for Undergraduates (REU)*, The University of Texas at Austin, under NSF Grant: Topology, Geometry, and Physics, 1993-1994. Performed research into applying matching pursuits to the numerical solution of ordinary differential equations, under the supervision of Professor Karen Uhlenbeck.
- *Junior Fellows Honors Research Program*, The University of Texas at Austin, 1992-1993. Performed research into composite wavelet and chirplet transforms, under the supervision of Professor Joseph Lakey.
- *Dean's List*, College of Engineering at The University of Texas at Austin, 1991-1992.

Professional Activities

- Editorial Board Member, MDPI Information Journal, 2017 – Present.
- Member of the Technical Program Committee for the 2017 IEEE WIFS (Workshop on Information Forensics and Security).
- Area Editor, IEEE Signal Processing Magazine, 2015-2016
- Regional Director, IEEE Signal Processing Society, Regions 1-6, 2015-2016
- Chair Information Forensics and Security Technical Committee, IEEE Signal Processing Society, 2016

- Vice-Chair Information Forensics and Security Technical Committee, IEEE Signal Processing Society, 2015
- Guest Editor, Special Issue on Signal and Information Processing for Privacy, IEEE Journal on Special Topics in Signal Processing, 2015
- Chair of the Steering Committee for IEEE Transactions on Mobile Computing, January 2014 – December 2016.
- Panel Co-Chair and Area Chair, 2014 IEEE CNS (IEEE Conference on Communications and Network Security)
- Member of the Technical Program Committee for the 2014 IEEE VTC (IEEE Vehicular Technology Conference)
- Guest Editor, Special Issue on Signal Processing for Cyber-security and Privacy, IEEE Signal Processing Magazine, 2013
- Member of the Technical Program Committee for the 2013 ICDCS (IEEE International Conference on Distributed Computing Systems)
- Member of the Technical Program Committee for the 2013 MILCOM (IEEE Military Communications Conference)
- Member of the Technical Program Committee, ACM Conference on Security and Privacy in Wireless and Mobile Networks, WiSec 2013.
- Member of the Technical Program Committee for the 2013 Network & Distributed System Security Symposium (NDSS)
- Program co-Chair, ACM Conference on Security and Privacy in Wireless and Mobile Networks, WiSec 2012.
- Member of the Technical Program Committee for the 2012 IEEE International Workshop on Information Forensics and Security (WIFS'12)
- Member of the Technical Program Committee for the 2012 ICDCS (IEEE International Conference on Distributed Computing Systems)
- Member of the Technical Program Committee for the 2012 ACM International Symposium on Mobile Ad Hoc Networking and Computing
- Member of the Technical Program Committee for the 2012 Network & Distributed System Security Symposium (NDSS)
- Associate Editor, IEEE Transactions on Information Forensics and Security, 2009-2013
- IEEE Signal Processing Society Representative to the Steering Committee of the IEEE Transactions on Mobile Computing, 2009-2012
- Associate Editor, IEEE Transactions on Mobile Computing, 2008-2011.
- Member of the Technical Program Committee for 2011 IEEE International Conference on Computer Communications (Infocom)
- Program co-Chair for the 2011 IEEE International Workshop on Information Forensics and Security (WIFS'11)
- Chair for the Poster and Demo Session for the 2010 ACM Conference on Wireless Network Security (WiSec)
- Member of the Technical Program Committee for the 2010 ICDCS (IEEE International Conference on Distributed Computing Systems)
- Member of the Technical Program Committee for 2010 IEEE International Conference on Computer Communications (Infocom)
- Book Review Editor for the IEEE Signal Processing Magazine, 2005-2009
- Member of the Technical Program Committee for 2009 IEEE International Conference on Computer Communications (Infocom)
- Member of the Technical Program Committee for 2009 Tridentcom
- Member of the Technical Program Committee for 2009 ACM International Conference on Mobile Computing (Mobicom).

- Member of the Technical Program Committee for 2009 European Symposium on Research in Computer Security (ESORICS).
- Member of the Technical Program Committee for 2009 IEEE International Conference on Mobile Ad-hoc and Sensor Systems (MASS).
- Member of the Technical Program Committee for the 2009 International Conference on Testbeds and Research Infrastructures for the Development of Networks and Communities
- Member of the Technical Program Committee for the ACM Conference on Wireless Security (WiSec), 2008.
- Member of the Technical Program Committee for the 3rd IEEE Workshop on Networking Technologies for Software Defined Radio Networks, 2008.
- Member of the Technical Program Committee for 2008 IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON).
- Member of the Technical Program Committee for 2008 IEEE International Conference on Computer Communications (INFOCOM).
- Member of the Technical Program Committee for the 2008 IEEE International Conference on Mobile Ad hoc and Sensor Systems (MASS)
- Member of the Technical Program Committee for the 2008 IEEE International Conference on Distributed Computing Systems (ICDCS)
- Member of the National Science Foundation GENI Wireless Working Group, 2007-2008
- Member of the Technical Program Committee for 2006 IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON).
- Member of the Technical Program Committee for 2007 IEEE International Conference on Computer Communications (INFOCOM).
- Member of the Technical Program Committee for the Fourth ACM Workshop on Security of Ad Hoc and Sensor Networks (SASN), 2006.
- Member of the Technical Program Committee for the 2nd International Workshop on Wireless and Sensor Networks Security (WSNS'06)
- Member of the Technical Program Committee for the SECRIPT 2006 International Conference on Security and Cryptography
- Member of the Technical Program Committee for the 2004 ACM Workshop on Wireless Security
- Member of the Technical Program Committee for the 2005 IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks
- Member of the Technical Program Committee for 2005 IEEE Wireless Communications and Networking Conference
- Organizing Committee Member for IEEE/Create-Net Conference on Testbeds and Research Infrastructure for the Development of Networks and Communities (TridentCOM) 2006.
- Reviewer for IEEE Transactions on Information Forensics and Security
- Reviewer for IEEE Transaction on Multimedia
- Reviewer for IEEE Transaction on Signal Processing
- Reviewer for IEEE Transaction on Image Processing
- Reviewer for IEEE Transaction on Communications
- Reviewer for IEEE Transaction on Networking
- Reviewer for IEEE Transaction on Wireless Communications
- Reviewer for IEEE Signal Processing Magazine
- Reviewer for IEEE Transactions on Knowledge and Data Engineering
- Reviewer for Kluwer Wireless Personal Communications
- Reviewer for EURASIP Journal on Applied Signal Processing
- Participant at the MPEG-4 Intellectual Property Management and Protection (IPMP) Meeting, La Baule, France. Presented "Dynamic M⁴: A Dynamic Multicast Key Management Scheme for Groups of Mobile Multimedia Users" to the MPEG-4 IPMP standards committee, October 2000.

- Reviewer for NSF EECS Panel (2012), NSF ProWIN Panel (2004, 2005); NSF Cybertrust Panel (2008); NSF IGERT Panel (2008), NSF ECCS Panel (2012)

Professional Affiliations

- IEEE Signal Processing Society
- IEEE Communication Society
- IEEE Computer Society
- American Association for the Advancement of Science (AAAS)
- AFCEA (Armed Forces Communications and Electronics Association)

Research Grants

1. "CI-EN: ORBIT GEN 3- Enhancing the ORBIT Testbed with LTE and Cloud Radio Processing," W. Trappe, *National Science Foundation*, \$2.275M, 2015-2018. (co-Investigator)
2. "FIA-NP: Collaborative Research: The Next-Phase MobilityFirst Project—from Architecture and Protocol Design to Advanced Services and Trial Deployments," W. Trappe, *National Science Foundation*, \$2.9M, 2014-2018. (co-Investigator)
3. "CIF: SMALL: Spatiotemporally Varying Channel Map Estimation and Tracking in Wireless Networks," W. Trappe, *National Science Foundation*, \$500K, 2015-2018. (co-Investigator)
4. "Collaborative Research: A Multi-layer Approach Towards Reliable Cognitive Radio Networks," W. Trappe, *National Science Foundation*, \$285K, 2014-2017 (Principal Investigator, VaTech collaborator)
5. "Collaborative Situation Aware PNT (CSAP) Solution," W. Trappe, *Air Force STTR (via subcontract from Mayflower)*, \$45K, August 2015-January 2016.
6. "Directional Network Waveform," W. Trappe, *Army CERDEC (via subcontract from DSCI)*, \$197K, May 2015-September 2016 (Principal Investigator)
7. "Building the Computing Backend for In-Depth Analysis of Wireless and Network Data," W. Trappe, *Army Research Office*, \$129K, 2014-2015 (co-Investigator)
8. "Trust-enabled Networks with Policy: TENSLE," W. Trappe, *DARPA*, \$128K, 2013-2014 (co-Investigator, subcontract award from Lockheed Martin).
9. "Radar Communications Spectrum Sharing System (RCS3)," W. Trappe, *DARPA*, \$70K, 2013-2014 (co-Investigator, subcontract award from Lockheed Martin).
10. "Spectrum Challenge," W. Trappe, *DARPA*, \$631K, 2013-2014 (Principal Investigator).
11. "EARS: Collaborative Research: Big Bandwidth: Finding Anomalous Needles in the Spectrum Haystack," W. Trappe, *National Science Foundation*, \$300K, 2012-2015. (Principal Investigator, Princeton collaborator).
12. "NeTS: Small: Collaborative Research: OSTARA: An Optically-based Simultaneous Transmit And Receive Architecture for Enhancing Wireless Communications," W. Trappe, *National Science Foundation*, \$100K, 2012-2015. (Principal Investigator, Princeton collaborator).
13. "Management of RF Network and Tasking Infrastructure," W. Trappe, *DARPA*, \$123K, 2012-2013 (co-Investigator, subcontract award from Applied Communications Sciences).
14. "Scalable MANET-based Peer-to-Peer VoIP/Multimedia Architecture," W. Trappe, *Army CERDEC via subcontract through Battelle*, \$43K, 2012-2013. (Principal Investigator).
15. "MIAMI: Mobile Infrastructures for Advancing Military Information Technologies," W. Trappe, *Army CERDEC (S&TCD)*, \$9,814,214, 2009-2014. (Principal Investigator). (Task 1 Award \$660K, Task 2 Award \$500K.)
16. "FIA: Collaborative Research: Mobility First: A Robust and Trustworthy Mobility-Centric Architecture for the Future Internet," D. Raychaudhuri, M. Gruteser, R. Yates, W. Trappe, Y. Zhang, R. Martin, *National Science Foundation*, \$2,730,000, 2010-2013. (Co-Investigator).
17. "Scenario Based Tactical Radio Channel Simulator," W. Trappe and L. Greenstein, *Navy (via dBm subcontract)*, \$24K, 2011. (Principal Investigator)

18. “TC: Large: Collaborative Research: AUSTIN—An Initiative to Assure Software Radios have Trusted Interactions,” W. Trappe, N. Minsky, R. Wright, Y. Zhang, *National Science Foundation*, \$410K, 2009-2012. (Principal Investigator)
19. “Enhancing the Security of Wireless Systems through Opportunistic Secret Communications,” W. Trappe and R. Yates, *Army Research Office*, \$230K, 2009-2011. (Principal Investigator)
20. “Enhancing Cross-Layer Protocol Design and Experimentation via Augmentation of the ORBIT Wireless Testbed,” W. Trappe, N. Mandayam, D. Raychaudhuri, *Army Research Office*, \$65K, 2008-2009. (Principal Investigator)
21. “The Orbit Radio Grid as a Flexible Large-Scale Community Testbed for Next-Generation Wireless Network Research,” D. Raychaudhuri, W. Trappe, M. Gruteser, E. Blossom, *National Science Foundation*, \$1,500,000, 2007-2010 (Co-Investigator)
22. “CT-T: TRIESTE: A Trusted Radio Infrastructure for Enforcing Spectrum Etiquettes,” W. Trappe, Y. Zhang, C. Rose, J. Park, T. Hou, J. Reed, *National Science Foundation*, \$50,000, 2007 (Principal Investigator)
23. “SEVILLE: Security via Lower Layer Enforcements,” W. Trappe, *DARPA/ATO*, \$194K, 2007.
24. “A Roll-Call System for Asset Tracking,” W. Trappe, and Y. Zhang, *National Science Foundation (STTR)*, \$75K, 2007. (Principal Investigator)
25. “NeTS-PROWIN: Fingerprints in the Ether: Exploiting the Radio Channel to Enhance Wireless Security,” W. Trappe, N. Mandayam and L. Greenstein, *National Science Foundation*, \$581K, 2006-2009. (Principal Investigator)
26. “NeTS-NOSS: PARIS: A Framework for Privacy Augmented Relaying of Information from Sensors”, W. Trappe and Y. Zhang, *National Science Foundation*, \$500K, 2004-2007. (Principal Investigator).
27. “ORBIT: Open-Access Research Testbed for Next-Generation Wireless Networks”, D. Raychaudhuri, R. Yates, W. Trappe, M. Parashar, Y. Zhang, H. Kobayashi (Princeton), H. Schulzrinne (Columbia), S. Paul (Bell Labs), K. Ramaswamy (Thomson R&D), A. Acharya (IBM Watson), *National Science Foundation*, \$5.4M, 2003-2006, (Co-Investigator).
28. “Security Architectures for Current and Future Wireless Networks,” W. Trappe and D. Raychaudhuri, *National Institute for Communication Technology (NICT, Japan)*, \$200K, 2002-2006. (Principal Investigator).
29. “A Collusion-Resistant Multimedia Fingerprinting Framework for Information Forensics,” M. Wu, K.J.R. Liu, Z. J. Wang and W. Trappe, *Air Force Research Laboratories*, \$45K subcontract, 2003-2004 (Co-Investigator)

Publications

Books:

1. W. Trappe and L. C. Washington, *Introduction to Cryptography with Coding Theory*. Prentice Hall, (First Edition 2001, Second Edition 2005).
2. K.J.R. Liu, W. Trappe, Z. J Wang, M. Wu, H. Zhao, *Digital Fingerprinting for Multimedia Forensics*, Hindawi Press, 2005.
3. Y. Sun, W. Trappe, K.J.R. Liu, *Network-Aware Security for Group Communications*, Springer-Verlag, 2007.
4. Y. Chen, W. Xu, W. Trappe, Y. Zhang, *Securing Emerging Wireless Systems: Lower-layer Approaches*, Springer-Verlag, 2008.
5. R. Liu and W. Trappe, *Securing Wireless Communications at the Physical Layer*, Springer-Verlag, 2009.
6. J. Yang, Y. Chen, W. Trappe, J. Cheng, *Pervasive Wireless Environments: Detecting and Localizing User Spoofing*, Springer-Verlag, 2014.

Refereed Journals:

1. X. Liu, M. Zhao, S. Li, F. Zhang, W. Trappe, “A Security Framework for the Internet of Things in the Future Internet Architecture,” *MDPI Future Internet Journal*, vol. 9, no. 3, 2017.

2. A. Garnaev, W. Trappe, "Bandwidth Scanning when Facing Interference Attacks Aimed at Reducing Spectrum Opportunities," *IEEE Trans. on Information Forensics and Security*, vol. 12, no. 8, pg.1916 - 1930, 2017.
3. Y. Liu, A. Garnaev, W. Trappe, "Connectivity Jamming Game for Physical Layer Attacks in Peer to Peer Networks," *Security and Communication Networks*, 2017.
4. A. Garnaev, W. Trappe, "Bargaining over the Fair Tradeoff Between Secrecy and Throughput in OFDM Communications," *IEEE Trans. on Information Forensics and Security*, vol. 1, pg. 242-251, 2017.
5. X. Yuan, X. Qin, F. Tian, B. Jalaian, Y. Hou, W. Lou, W. Trappe, "An online admission control algorithm for dynamic traffic in underlay coexistence paradigm," *IEEE Trans. on Cognitive Communications and Networking*, vol. 2, pg. 411-426, 2016.
6. X. Liu, W. Trappe, "An Overlay Tunneling as a Policy Tool for Defending Mobile Ad Hoc Networks," *Security and Communication Networks*, vol. 9, pg. 4482-4494, 2016.
7. B. Li, A. Petropulu, W. Trappe, "Optimum Co-design for Spectrum Sharing between Matrix Completion-based MIMO Radars and MIMO Communication System," *IEEE Trans. on Signal Processing*, vol. 64, pg. 4562-4575, 2016.
8. T. Sun, Y. Zhang, W. Trappe, "Improving Access Point Association Protocols Through Channel Utilization and Adaptive Probing," *IEEE Trans. on Mobile Computing*, vol. 15, pg. 1157-1167, 2016.
9. A. Garnaev, W. Trappe, "A Bandwidth Monitoring Strategy under Uncertainty of the Adversary's Activity," *IEEE Trans. on Information Forensics and Security*, vol. 11, pg. 837-849, 2016.
10. A. Garnaev, Y. Liu, W. Trappe, "Anti-jamming Strategy Versus a Low-Power Jamming Attack When Intelligence of Adversary's Attack Type is Unknown," in *IEEE Transactions on Signal and Information Processing over Networks*, vol. 2, no. 1, 2016.
11. Y. Liu, W. Trappe, "Topology adaptation for robust ad hoc cyberphysical networks under puncture-style attacks," in *Tsinghua Science and Technology Journal*, pg. 364-375, 2015.
12. W. Trappe, "The Challenges Facing Physical Layer Security," in *IEEE Communications Magazine*, vol. 53, no. 6, pg. 16-20, 2015.
13. A. Garnaev, W. Trappe, "One-time Spectrum Coexistence in Dynamic Spectrum Access When the Secondary User May Be Malicious," in *IEEE Trans. on Information Forensics and Security*, vol. 10, no. 5, pg. 1064-1075, 2015.
14. W. Trappe, R. Moore, R. Howard, "Low-Energy Security: Limits and Opportunities in the Internet of Things," in *IEEE Security and Privacy*, pg. 14-21, 2015.
15. A. Garnaev, W. Trappe, "Optimum Scanning Bandwidth Strategy Incorporating Uncertainty about Adversary's Characteristics," in *ICST Trans. on Mobile Communications*, 2014.
16. L. Sankar, W. Trappe, K. Ramchandran, H. V. Poor, M. Debbah, "The Role of Signal Processing in Meeting Privacy Challenges: An Overview," in *IEEE Signal Processing Magazine*, pg. 95-106, 2013.
17. J. Yang, Y. Chen, W. Trappe, J. Cheng, "Detection and Localization of Multiple Spoofing Attackers in Wireless Networks," in *IEEE Trans. on Parallel and Distributed Systems*, vol. 24, pg. 44-58, 2013.
18. R. Miller, W. Trappe, "On the Vulnerabilities of CSI in MIMO Wireless Communication Systems," in *IEEE Trans. on Mobile Computing*, vol. 8, pg. 1386-1398, 2012.
19. A. O. Kaya, W. Trappe, L. Greenstein, D. Chizhik, "Predicting MIMO Performance in Urban Microcells Using Ray Tracing to Characterize the Channel," in *IEEE Trans. On Wireless Communications*, vol. 11, pg. 2402 -2411, 2012.
20. S. Mathur, W. Trappe, "BIT-TRAPS: Building Information-Theoretic Traffic Privacy into Packet Streams," in *IEEE Trans. on Information Forensics and Security*, vol. 6, pg. 752-762, 2011.
21. Y. Zhang, Z. Wu, W. Trappe, "Adaptive Location-Oriented Content Delivery in Delay-Sensitive Pervasive Applications," in *IEEE Trans. on Mobile Computing*, vol. 10, pg. 362-376, 2011.
22. B. Russell, M. Littman, T. Trappe, "Integrating Machine Learning in Ad Hoc Routing: A Wireless Adaptive Routing Protocol," in *Int. Journal on Commun. Systems*, vol. 24, pg. 950-966, 2011.
23. S. Chen, Y. Chen, W. Trappe, "Inverting Systems of Embedded Sensors for Position Verification in Location-Aware Applications," in *IEEE Trans. on Parallel and Distributed Systems*, vol. 21, pg. 722-736, 2010.

24. S. Mathur, A. Reznik, C. Ye, R. Mukherjee, A. Rahman, Y. Shah, W. Trappe, N. Mandayam, "Exploiting the Physical Layer for Enhanced Security," in *IEEE Wireless Communications Magazine*, vol. 17, pg. 63-70, Oct. 2010.
25. Y. Chen, J. Yang, W. Trappe, R. Martin, "Detecting and Localizing Identity-based Attacks in Wireless and Sensor Networks," in *IEEE Trans. on Vehicular Technology*, vol. 59, pg. 2418-2434, 2010.
26. M. Rodoper, W. Trappe, E. Jung, "An IBC and Certificate Based Hybrid Approach to WiMAX Security," in *Journal of Communications and Networks*, vol. 11, pg. 615-625, 2010.
27. Z. Li, R. Yates, W. Trappe, "Achieving Secret Communication for Fast Rayleigh Fading Channels," in *IEEE Trans. on Wireless Communications*, vol. 9, pg. 2792-2799, 2010.
28. C. Ye, S. Mathur, A. Reznik, W. Trappe and N. Mandayam, "Information-theoretically Secret Key Generation for Fading Wireless Channels", in *IEEE Transactions on Information Forensics and Security*, vol. 5, no. 2, pg. 240-254, June 2010.
29. L. Xiao, L. Greenstein, N. Mandayam, W. Trappe, "Channel-based Spoofing Detection in Frequency-Selective Rayleigh Channels," in *IEEE Transactions on Wireless Communications*, vol. 8, Issue 12, pg. 5948-5956, Dec. 2009.
30. P. Kamat, W. Xu, Y. Zhang, W. Trappe, "Temporal Privacy in Wireless Sensor Networks: Theory and Practice," in *ACM Transactions on Sensor Networks*, vol. 5, issue 4, pg. 1-24, Nov. 2009.
31. A. O. Kaya, L. Greenstein, W. Trappe, "Characterizing indoor wireless channels via ray tracing combined with stochastic modeling," in *IEEE Transactions on Wireless Communications*, vol. 8, Issue 8, pg. 4165-4175, Aug. 2009.
32. L. Xiao, L. Greenstein, N. Mandayam, W. Trappe, "Channel-Based Detection of Sybil Attacks in Wireless Networks," in *IEEE Transactions on Information Forensics and Security*, vol. 4, Issue 3, pg. 492-503, Sept. 2009.
33. W. Xu, W. Trappe and Y. Zhang, "Defending Wireless Sensor Networks from Radio Interference through Channel Adaptation," in *ACM Transactions on Sensor Networks (TOSN)*, vol. 4, issue 4, pg. 1-34, Aug. 2008.
34. Q. Li, M. Zhao, J. Walker, Y-C. Hu, A. Perrig, and W. Trappe, "SEAR: A Secure Efficient Ad Hoc On Demand Routing Protocol for Wireless Networks," in *Security and Communication Networks*, vol. 2, issue 4, pg. 325-340, July/August 2009.
35. Y. Chen, K. Kleisouris, X. Li, W. Trappe, R. P. Martin, "A Security and Robustness Performance Analysis of Localization Algorithms to Signal Strength Attacks," in *ACM Transactions on Sensor Networks (ACM TOSN)*, Volume 5, Issue 1, pg. 1-37, February 2009
36. S. Chen, Y. Chen, Wade Trappe, "Exploiting Environmental Properties for Wireless Localization," *ACM SIGMOBILE Mobile Computing and Communications Review (MC2R)*, vol. 12, pg. 49-51, 2008.
37. L. Xiao, L. Greenstein, N. Mandayam, W. Trappe, "Using the Physical Layer for Wireless Authentication in Time-variant Channels," in *IEEE Transactions on Wireless Communications*, vol. 7, pg. 2571 – 2579, July 2008.
38. P. Kamat, A. Baliga, W. Trappe, "Secure, Pseudonymous, and Auditable Communication in Vehicular Ad Hoc Networks," *Security and Communication Networks*, pg. 233-244, May, 2008.
39. Q. Li and W. Trappe, "Detecting Spoofing and Anomalous Traffic in Wireless Network via Forge-Resistant Relationships," *IEEE Trans. on Information Forensics and Security*, vol. 2, pg. 793-808, Dec. 2007.
40. K. Ma, Y. Zhang, W. Trappe, "Managing Mobile Sensor Networks Using Network Dynamics," *IEEE Transactions on Parallel and Distributed Computing*, vol. 19, pg. 106-120, Jan. 2008.
41. Q. Li and W. Trappe, "Reducing Delay and Enhancing DoS Resistance in Multicast Authentication through Multi-grade Security," *IEEE Trans. On Information Forensics and Security*, vol. 1, pg. 190-204, June 2006.
42. W. Xu, K. Ma, W. Trappe, Y. Zhang, "Jamming Sensor Networks: Attack and Defense Strategies," *IEEE Networks Special Issue on Sensor Networks*, vol. 20, pg. 41-47, May 2006.
43. M. Wu, W. Trappe, Z.J. Wang, K.J.R. Liu, "Collusion-resistant Fingerprinting for Multimedia," *IEEE Signal Processing Magazine*, vol. 21, pg. 15-27, 2004.

44. Z. J. Wang, M. Wu, W. Trappe and K.J.R. Liu, "Group Oriented Fingerprinting for Multimedia Forensics," *EURASIP Journal of Applied Signal Processing*, pg. 2153-2173, October 2004. (**EURASIP Best Paper Award, 2005**)
45. W. Trappe, M. Wu, Z. Wang, and K. J. R. Liu, "Anti-Collusion Fingerprinting for Multimedia," *IEEE Transactions on Signal Processing*, vol. 51, pg. 1069-1087, 2003. (**IEEE SPS Best Paper Award, 2005**)
46. W. Trappe, J. Song, R. Poovendran, and K. J. R. Liu, "Key Management and Distribution for Secure Multimedia Multicast," *IEEE Transactions on Multimedia*, vol. 5, pg. 544-557, 2003.
47. Y. Sun, W. Trappe, and K. J. R. Liu, "A Scalable Multicast Key Management for Heterogeneous Wireless Networks," *IEEE Transactions on Networking*, vol. 12, pg. 653-666, 2004.
48. W. Trappe, Y. Wang, and K. J. R. Liu, "Resource-aware Conference Key Establishment for Heterogeneous Networks," *IEEE/ACM Transactions on Networking*, vol. 13, pg. 134-146, 2005.
49. Z. J. Wang, M. Wu, H. Zhao, W. Trappe, and K.J.R. Liu, "Anti-collusion forensics of multimedia fingerprinting using orthogonal modulation," *IEEE Trans. On Image Proc.*, vol. 14, pg. 804-821, 2005.
50. T. Lawrence, W. Trappe, and N. Bedford, "The Influence of an Offshore Rise on Low-Frequency Modal Propagation," *Journal of Underwater Acoustics*, Vol. 48, No. 1, pg. 29-36, January 1998.
51. P. McCarty, J. Gross, W. Trappe, and D. Grant, "Minimum Detectable Target Strength Using Spectral Estimation Methods for the Active Barrier Problem," *Journal of Underwater Acoustics*, vol. 45, no. 1, pg. 135-154, January 1995.
52. T. Lawrence and W. Trappe, "Analysis of an Active Barrier Experiment in a Stable Shallow Water Environment," *Journal of Underwater Acoustics*, vol. 45, no. 1, pg. 65-86, January 1995.

Refereed Conferences:

1. A. Garnaev, S. Sagari, W. Trappe, "Bargaining over Fair Channel Sharing Between Wi-Fi and LTE-U Networks," in *Proceedings of the 2017 International Conference on Wired/Wireless Internet Communications*, pg. 3-15, 2017.
2. A. Garnaev, W. Trappe, A. Petropulu, "Equilibrium Strategies for an OFDM Network that Might Be Under a Jamming Attack," in *Proceedings of the 2017 51st Annual Conference on Information Sciences and Systems (CISS 2017)*, pg. 1-6, 2017.
3. A. Garnaev, W. Trappe, Y. T. Hou, W. Lou, "Spectrum Attacks Aimed at Minimizing Spectrum Opportunities," in *Proceedings of the 2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pg. 2092-2096, 2017.
4. A. Garnaev, W. Trappe, "A secrecy and security dilemma in OFDM Communications," in *Proceedings of the 2016 International Workshop on Multiple Access Communications (MACOM)*, pg. 111-125, 2016.
5. S. Ponnaluri, B. Azimi-Sadjadi, YK Hue, T. Erpek, A. Komae, W. Trappe, "A practical wireless reciprocity-aware key establishment protocol," in *Proceedings of the IEEE Military Communications Conference, MILCOM*, pg. 1107-1113, 2016.
6. A Garnaev, S Sagari, W Trappe, "Fair channel sharing by Wi-Fi and LTE-U networks with equal priority," in *Proceedings of the International Conference on Cognitive Radio Oriented Wireless Networks (CROWNCOM)*, pg. 91-103, 2016.
7. Z. Jia, M. Alaziz, X. Chi, RE. Howard, Y. Zhang, P. Zhang, W. Trappe, A. Sivasubramaniam, N. An, "HB-phone: a Bed-mounted Geophone-based Heartbeat Monitoring System," in *Proceedings of the 15th ACM/IEEE International Conference on Information Processing in Sensor Networks (IPSN)*, pg. 1-12, 2016.
8. Y Liu, A Garnaev, W Trappe, "Maintaining Throughput Network Connectivity in Ad Hoc Networks," in *Proceedings of the 2016 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pg. 6380-6384, 2016.
9. A. Garnaev, W. Trappe, "Impact of Incomplete Knowledge on Scanning Strategy," in *Proceedings of 2015 IEEE International Workshop on Information Forensics and Security (WIFS)*, pg. 1-6, 2015.
10. S. Sagari, S. Baysting, D. Saha, I. Seskar, W. Trappe, D. Raychaudhuri, "Coordinated Dynamic Spectrum Management of LTE-U and Wi-Fi Networks", in *Proceedings of the 2015 IEEE International Symposium on Dynamic Spectrum Access Networks (DySPAN 2015)*.

11. S. Sagari and W. Trappe, "Fair Allocation of Throughput under Harsh Operational Conditions", in *Proceedings of the 8th International Workshop on Multiple Access Communications (MACOM 2015)*.
12. A. Garnaev, W. Trappe, D. Stojadinovic, I. Seskar, "Spectrum Scanning when the Intruder Might Have Knowledge About the Scanner's Capabilities," in *Proceedings of the 2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pg. 1742-1746, 2015.
13. Y. Liu, W. Trappe, , "Jammer forensics: Localization in Peer to Peer networks Based on Q-learning," in *Proceedings of the 2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pg. 1737-1741, 2015.
14. A. Garnaev, W. Trappe, "Fair Resource Allocation under an Unknown Jamming Attack: A Bayesian Game," in *Proceedings of 2014 IEEE International Workshop on Information Forensics and Security (WIFS)*, pg. 227- 232, 2014.
15. A. Garnaev, W. Trappe, "Bandwidth Scanning Involving a Bayesian Approach to Adapting the Belief of an Adversary's Presence," in *Proceedings of the 2014 IEEE Conference on Communications and Network Security: CRESS Workshop*, pg. 35-43, 2014.
16. A. Garnaev, W. Trappe, "Anti-Jamming Strategies: A Stochastic Game Approach," in *Proceedings of the 6th International Conference on Mobile Networks and Management*, pg. 230-243, 2014.
17. Y. Liu, X. Liu, W. Trappe, R. Roy, "Distance-aware Overlay Routing with AODV in Large Scale Ad Hoc Networks," in *Proceedings of the 80th IEEE Vehicular Technology Conference (VTC)*, pg. 1 – 5, 2014.
18. X. Liu, W. Trappe, J. Lindqvist, "A Policy-driven Approach to Access Control in Future Internet Name Resolution Services," in *Proceedings of the 9th ACM workshop on Mobility in the evolving internet architecture*, pg. 7-12, 2014
19. S. Shweta, L. Greenstein, W. Trappe, "Emulating co-channel Interference in Wireless Networks using Equivalent Low-tap Filters," in *Proceedings of the 48th Annual Conference on Information Sciences and Systems (CISS)*, pg.1-6, 19-21 March 2014.
20. A. Garnaev, W. Trappe, "Secret Communications When the Eavesdropper Might be an Active Adversary," in *Proceedings of 7th International Workshop on Multiple Access Communications*, pg. 121-136, 2014. **(Best Paper Award)**
21. A. Garnaev, W. Trappe, "To Eavesdrop or Jam, That is the Question," in *Proceedings of AdHocNets 2013*, pg. 146-161, 2013.
22. A. Garnaev, W. Trappe, C.T. Kung, "Optimizing scanning strategies: Selecting scanning bandwidth in adversarial RF environments," in *Proceedings of the 2013 8th International Conference on Cognitive Radio Oriented Wireless Networks (CROWNCOM)*, pg.148-153, July 2013.
23. R. Dudheria, W. Trappe, N. Minsky, "Law governed peer-to-peer Secondary Spectrum Marketplaces," in *Proceedings of the Cognitive Radio Oriented Wireless Networks (CROWNCOM), 2013 8th International Conference on* , vol., no., pg.141-147, July 2013.
24. R. Dudheria, W. Trappe, "Security Analysis of Certified Wireless Universal Serial Bus Protocol," in *Proceedings of the 8th Annual Symposium on Information Assurance*, pg. 26-34, June 2013.
25. X. Liu, W. Trappe, Y. Zhang, "Secure Name Resolution for Identifier-to-Locator Mappings in the Global Internet," in *Proceedings of the 22nd International Conference on Computer Communications and Networks (ICCCN)*, pg.1-7, 2013.
26. S. Sagari, W. Trappe, L. Greenstein, "Equivalent Tapped Delay Line Channel Responses with Reduced Taps," in *Proceedings of the Vehicular Technology Conference (VTC Fall), 2013 IEEE 78th* , pg.1-5, Sept. 2013.
27. C. Mueller-Smith, W. Trappe, "Efficient OFDM Denial in the Absence of Channel Information," in *Proceedings of the Military Communications Conference, MILCOM 2013 - 2013 IEEE* , pg.89-94, Nov. 2013.
28. C. Xu, B. Firner, R. Moore, Y. Zhang, W. Trappe, R. Howard, F. Zhang, N. An, "SCPL: Indoor Device-free Multi-subject Counting and Localization Using Radio Signal Strength," in *Proceedings of the 12th International Conference on Information Processing in Sensor Networks*, pg. 79-90, 2013.
29. R. Dudheria, W. Trappe, N. Minsky, "Resilient Leadership Delegation in Tactical Systems," in *Proceedings of the Military Communications Conference, MILCOM 2013 - 2013 IEEE* , vol., no., pg.1906,1912, 18-20 Nov. 2013.

30. A. Garnaev, W. Trappe, "Stationary Equilibrium Strategies for Bandwidth Scanning," in *Proceedings of 6th International Workshop on Multiple Access Communications*, pg. 168-183, 2013.
31. A. Garnaev, W. Trappe, C.T. Kung, "Dependence of optimal monitoring strategy on the application to be protected," in *Proceedings of the Global Communications Conference (GLOBECOM), 2012 IEEE*, vol., no., pg.1054-1059, 3-7 Dec. 2012.
32. M. Rodoper, A. Baliga, E. Jung, W. Trappe, "An Efficient Security Framework for Mobile WiMAX," in the *Proceedings of the 27th Symposium on Applied Computing (SAC 2012)*, Trento, Italy, March 2012.
33. T. Sun, Y. Zhang, W. Trappe, "Association attacks: Identifying association protocols," *World of Wireless, Mobile and Multimedia Networks (WoWMoM), 2012 IEEE International Symposium on a*, vol., no., pg.1,5, 25-28 June 2012
34. J. Yang, Y. Chen; S. Macwan, C. Serban, S. Chen, W. Trappe, "Securing Mobile Location-based Services through position verification leveraging key distribution," *Wireless Communications and Networking Conference (WCNC), 2012 IEEE*, vol., no., pg.2694,2699, 1-4 April 2012.
35. S. Mathur, R. Miller, A. Varshavsky, W. Trappe, N. Mandayam, "ProxiMate: Proximity-based Secure Pairing using Ambient Wireless Signals," in *Proceedings of the 9th international conference on Mobile systems, applications, and services (MobiSys)*, pg. 211-224, 2011.
36. T. Sun, Y. Zhang, W. Trappe, "Improving Access Point Association Protocols through Channel Utilization and Adaptive Switching," in *Proceedings of the IEEE 8th International Conference on Mobile Ad Hoc and Sensor Systems (MASS)*, pg. 155-157, 2011.
37. R. Miller, W. Trappe, "ACE: Authenticating the Channel Estimation Process in Wireless Communication Systems," in *Proceedings of the Fourth ACM Conference on Wireless Network Security (WiSec 2011)*, pg. 91-96, 2011.
38. I. Rouf, R. Miller, H. Mustafa, T. Taylor, S. Oh, W. Xu, M. Gruteser, W. Trappe, and I. Seskar, "Security and Privacy Vulnerabilities of In-Car Wireless Networks: A Tire Pressure Monitoring System Case Study," in *Proceedings of the 19th USENIX Security Symposium*, Washington DC, August 11-13, 2010. **(Article covered by MIT Technology Review and CNN)**
39. R. Dudheria, W. Trappe and N. Minsky, "Coordination and Control in Mobile Ubiquitous Computing Applications Using Law Governed Interaction," in *Proceedings of UBIComm 2010*.
40. S. Mathur, T. Jin, N. Kasturirangan, J. Chandrasekaran, W. Xue, M. Gruteser, W. Trappe, "ParkNet: drive-by sensing of road-side parking statistics," in *Proceedings of the 8th international conference on Mobile systems, applications, and services (MobiSys 2010)*, pg. 123-136, 2010. **(BEST PAPER AWARD)**.
41. R. Miller and W. Trappe, "Subverting MIMO Wireless Systems by Jamming the Channel Estimation Procedure," in *Proceedings of the third ACM conference on Wireless network Security (WiSec 2010)*.
42. M. P. Fok, W. Trappe, and P. R. Prucnal, "All-Optical XOR Gate with Feedback Using Highly Ge-Doped Nonlinear Fiber," in the *Proceedings of the Optical Fiber Communication Conference and Exposition and the National Fiber Optic Engineers Conference (OFC/NFOEC 2010)*, OWF7, San Diego, California, USA, March 2010.
43. Y. Zhang, A. Baliga, W. Trappe, "Reactive On-board Regulation of Cognitive Radios," in *Proceedings of 2010 IEEE International Symposium on a World of Wireless Mobile and Multimedia Networks (WoWMoM)*, pg. 1 – 6, 2010.
44. M. Loiacono, J. Johnson, J. Rosca, W. Trappe, "Cross-Layer Link Adaptation for Wireless Video," in the *Proceedings of the IEEE International Communication Conference (ICC)*, pg. 1- 6, 2010.
45. L. Xiao, A. Reznik, W. Trappe, C. Ye, Y. Shah, L. Greenstein, N. Mandayam, "PHY-Authentication Protocol for Spoofing Detection in Wireless Networks," in the *Proceedings of the IEEE Global Telecommunications Conference (Globecom)*, pg. 1-6, 2010.
46. A.O. Kaya, W. Trappe, L. Greenstein, "Adapting MIMO Transmission Modes Along Paths in Urban Environments," in *Proceedings of the IEEE International Conference on Acoustics, Speech Signal Processing (ICASSP)*, 2010.
47. R. Miller, W. Trappe, "Physical Layer Techniques for Enhanced Situational Awareness," in *Proceedings of the IEEE International Conference on Acoustics, Speech Signal Processing (ICASSP)*, 2010.
48. A. Garnaev, W. Trappe, "An Eavesdropping Game with SINR as an Objective Function," in *Proceedings of 5th International Conference on Security and Communication Networks (SecureComm 2009)*, 2009.

49. A.O. Kaya, M. Chiang, W. Trappe, "P2P-ISP Cooperation: Risks and Mitigation," in *Proceedings of the IEEE Global Communications Conference (Globecom)*, Honolulu, Hawaii, December 2009. **(Best Paper Award)**
50. B. Firner, P. Jadhav, Y. Zhang, R. Howard, W. Trappe, E. Fenson, "Towards Continuous Asset Tracking: Low-Power Communication and Fail-Safe Presence Assurance," in *Proceedings of the 6th Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON)*, 2009.
51. B. Firner, P. Jadhav, Y. Zhang, R. Howard, W. Trappe, "Towards Continuous Tracking: Low-power Communication and Fail-Safe Presence Assurance," in *Proceedings of the International Conference on Information Processing in Sensor Networks (IPSN)*, pg.417-418, 2009.
52. S. Mathur, S. Kaul, M. Gruteser, W. Trappe, "ParkNet: A Mobile Sensor Network for Harvesting Real-time Vehicular Parking Information," in *Proceedings of the ACM MobiHoc S3 Workshop*, pg. 25-28, May 2009.
53. J. Yang, Y. Chen, W. Trappe, J. Cheng, "Determining the Number of Attackers and Localizing Multiple Adversaries in Wireless Spoofing Attacks," in *Proceedings of the 28th IEEE International Conference on Computer Communications*, April 2009. **(Acceptance Rate: 19.7%)**
54. S. Liu, L. Greenstein, Y. Chen, W. Trappe, "ALDO: An Anomaly Detection Framework for Dynamic Spectrum Access Networks," in *Proceedings of the 28th IEEE International Conference on Computer Communications*, April 2009. **(Acceptance Rate: 19.7%)**
55. S. Liu, Y. Chen, W. Trappe, L. Greenstein, "Non-interactive Localization of Cognitive Radios Based on Dynamic Signal Strength Mapping," in *Proceedings of the Sixth International Conference on Wireless On-demand Network Systems and Services (WONS)*, February 2009. **(Best Paper Award)**
56. A. Kaya, L. Greenstein, W. Trappe, "Characterizing Indoor Wireless Channels via Ray Tracing, and Validation via Measurements," in *Proceedings of the 2008 IEEE Global Telecommunication Conference*, pg. 1-5, Dec. 2008.
57. A. Kaya, L. Greenstein, W. Trappe, "Modeling Temporal Channel Variations in Indoor Wireless Environments," in *Proceedings of the 2008 IEEE Military Communications Conference (MILCOM)*, pg. 1-7, Nov. 2008.
58. Z. Li, R. Yates, W. Trappe, "Secrecy Capacity Region of a Class of One-sided Interference Channel," in *Proceedings of the IEEE International Symposium on Information Theory, 2008. ISIT 2008*, pg.379-383, July 2008.
59. S. Mathur, W. Trappe, N. Mandayam, C. Ye and A. Reznik, "Radio-telepathy: Extracting a Cryptographic Key from an Un-authenticated Wireless Channel," in the *Proceedings of the 14th Annual International Conference on Mobile Computing and Networking*, (ACM MobiCom 2008) **(Acceptance Rate: 11.7%)**.
60. W. Xu, W. Trappe, Y. Zhang, "Anti-Jamming Timing Channels for Wireless Networks," in *Proceedings of the 1st ACM Conference on Wireless Security (WiSec)*, pg. 203-213, 2008. **(Acceptance Rate: 16.7%)**
61. Y. Chen, W. Trappe, R. Martin, "Attack Detection in Wireless Localization," in *Proceedings of 27th IEEE International Conference on Computer Communications*, 2008. **(Acceptance Rate: 18%)**
62. R. Miller, S. Jain, W. Trappe, "Radio Teaming: Establishing Communication when Communication is not Possible," in *Proceedings of the 5th IEEE International Conference on Mobile Ad Hoc and Sensor Systems (MASS'08)*, pg. 365-370, 2008.
63. B. Firner, S. Medhekar, Y. Zhang, R. Howard, W. Trappe, P. Wolniansky and E. Fenson, "PIP Tags: Hardware Design and Power Optimization," in *Proceedings of HotEmNets*, 2008.
64. L. Xiao, L. Greenstein, N. Mandayam, W. Trappe, "A Physical-Layer Technique to Enhance Authentication for Mobile Terminals," in *Proceedings of the 2008 IEEE International Conference on Communications*, pg. 1520-1524, May 2008.
65. S. Medhekar, R. Howard, W. Trappe, Y. Zhang, P. Wolniansky, "Mining Joules and Bits: Towards a Long-Life Pervasive System," in *Proceedings of the IEEE International Symposium on Parallel and Distributed Processing (IPDPS)*, pg. 1-8, April 2008.
66. L. Xiao, L. Greenstein, N. Mandayam, W. Trappe, "MIMO-assisted Channel-based Authentication in Wireless Networks," in *Proceedings of the 42nd Annual Conference on Information Sciences and Systems*, pg. 642-646, 2008.

67. Y. Chen, W. Trappe, R. Martin, "Detecting and Localizing Wireless Spoofing Attacks," in *Proceedings of the Fourth Annual IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Communications and Networks*, pg. 193-202, May 2007. **(Acceptance rate: 20%)**
68. S. Chen, Y. Chen, W. Trappe, "Poster: Exploiting Environmental Properties for Wireless Localization," in *Proceedings of the Thirteenth Annual International Conference on Mobile Computing and Networking (MobiCom 2007)*, 2007.
69. R. Miller, W. Xu, P. Kamat, W. Trappe, "Service Discovery and Device Identification in Cognitive Radio Networks," in *Proceedings of the IEEE Workshop on Networking Technologies for Software Defined Radio Networks*, 2007.
70. L. Xiao, L. Greenstein, N. Mandayam, W. Trappe, "Fingerprints in the Ether: Using the Physical Layer for Wireless Authentication," in *Proceedings of the IEEE International Conference on Communications*, pg. 4646-4651, June 2007.
71. Z. Li, R. Yates, W. Trappe, "Secure Communication with a Fading Eavesdropper Channel," in the *Proceedings of the IEEE International Symposium on Information Theory (ISIT)*, pg. 1296-1300, 2007.
72. Z. Li, W. Trappe, R. Yates, "Secret Communication via Multi-antenna Transmission," in the *Proceedings of the 41st Annual Conference on Information Sciences and Systems (CISS2007)*, pg. 905-910, 2007.
73. M. Loiacono, M. Rosca, W. Trappe, "The Snowball Effect : Detailing Performance Anomalies of 802.11 Rate Adaptation," in *Proceedings of the IEEE Global Telecommunications Conference*, pg. 5117-5122, Nov 2007.
74. P. Kamat, W. Xu, W. Trappe, Y. Zhang, "Temporal Privacy in Wireless Sensor Networks," in the *Proceedings of the 27th IEEE Int. Conference on Distributed Computing Systems (ICDCS07)*, pg. 23-31, 2007. **(Acceptance Rate: 13%)**
75. Y. Zhang, G. Bhanage, W. Trappe, Y. Zhang, R. Howard, "Facilitating an Active Transmit-only RFID System through Receiver-based Processing," in the *Proceedings of the Fourth Annual IEEE Communications Society Conference on Sensor, Mesh, and Ad Hoc Communications and Networks*, 2007. **(Acceptance Rate: 20%)**
76. Y. Chen, W. Trappe, R. Martin, "Detecting and Localizing Wireless Spoofing Attacks," in the *Proceedings of the Fourth Annual IEEE Communications Society Conference on Sensor, Mesh, and Ad Hoc Communications and Networks*, 2007. **(Acceptance Rate: 20%)**
77. M. Kuroda, W. Trappe, R. Nomura, "A Radio-independent Authentication Protocol (EAP-CRP) for Networks of Cognitive Radios," *Proceedings of the Fourth Annual IEEE Communications Society Conference on Sensor, Mesh, and Ad Hoc Communications and Networks*, pg. 70 – 79, 2007. **(Acceptance Rate: 20%)**
78. W. Xu, W. Trappe, Y. Zhang, "Channel Surfing: Defending Wireless Sensor Networks from Jamming and Interference," in the *Proceedings of the IEEE/ACM International Conference on Information Processing in Sensor Networks (IPSN)*, 2007. **(Acceptance Rate: 22%)**
79. Y. Chen, W. Trappe, R. Martin, "Attack Detection in Wireless Localization," in the *Proceedings of the 26th Annual IEEE Conference on Computer Communications (Infocom)*, 2007. **(Acceptance Rate: 18%)**
80. Z. Li, R. Yates, W. Trappe, "Secrecy Capacity of Independent Parallel Channels," *Proceedings of the 44th Annual Allerton Conference on Communication, Control, and Computing*, Sept. 2006.
81. W. Xu, W. Trappe and Y. Zhang, "Poster Abstract: Channel Surfing: Defending Wireless Sensor Networks from Jamming and Interference," *Proceedings of the 4th ACM Conference on Embedded Networked Sensor Systems (SenSys 2006)*.
82. S. Chen, Y. Zhang, W. Trappe, "Inverting Sensor Networks and Actuating the Environment for Spatio-Temporal Access Control," in the *Proceedings of the 2nd ACM workshop on Security of Ad hoc and Sensor Networks*, 2006.
83. Z. Li, W. Xu, R. Miller, W. Trappe, "Securing Wireless Systems Via Lower Layer Enforcements," in the *Proceedings of the 2006 ACM Workshop on Wireless Security*, pg. 33-42, 2006. **(Acceptance Rate: 19.6%)**
84. P. Kamat, A. Kamat, W. Trappe, "Poster: An Identity-based Security Framework for Vehicular Networks," in the *Proceedings of the Third ACM International Workshop on Vehicular Ad Hoc Networks*, 2006.
85. Q. Li, W. Trappe, "Light-weight Detection of Spoofing Attacks in Wireless Networks," in *Proceedings of IEEE Workshop on Wireless and Sensor Network Security*, 2006.

86. W. Xu, P. Kamat, W. Trappe, "TRIESTE: A Trusted Radio Infrastructure for Enforcing SpecTrum Etiquettes," in *Proceedings of the IEEE Workshop on Networking Technologies for Software Defined Radio (SDR) Networks*.
87. Q. Li and W. Trappe, "Relationship-based Detection of Spoofing-related Anomalous Traffic in Ad Hoc Networks," *Proceedings of the Third IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Networks*, 2006. **(Acceptance Rate: 26%)**
88. Y. Chen, J-A. Francisco, W. Trappe and R. Martin, "A Practical Approach to Landmark Deployment for Indoor Localization," *Proceedings of the Third IEEE Communications Society Conference on Sensor, Mesh and Ad Hoc Networks*, 2006. **(Acceptance Rate: 26%)**
89. Y. Chen, K. Kleisouris, X. Li, W. Trappe, R. Martin, "The Robustness of Localization Algorithms to Signal Strength Attacks: A Comparative Study," In *Proceedings of International Conference on Distributed Computing in Sensor Systems (DCOSS 2006)*, San Francisco, CA, USA, June 2006.
90. K. Ma, Y. Zhang, W. Trappe, "Mobile Network Management and Robust Spatial Retreats via Network Dynamics," In *Proceedings of the 1st International Workshop on Resource Provisioning and Management in Sensor Networks (RPMSN05)*, pg. 235-242, Nov. 2005.
91. W. Trappe, Y. Zhang, B. Nath, "MIAMI: Methods and Infrastructure for the Assurance of Measurement Information," In *Proceedings of the 2nd International VLDB Workshop on Data Management for Sensor Networks*, pg. 11-17, August 2005
92. Q. Li and W. Trappe, "Staggered TESLA: A Multicast Authentication Scheme Resistant to DoS Attacks," In the *Proceedings of the IEEE Global Telecommunication Conference (Globecom)*, pg. 1670-1675, Nov. 2005.
93. Z. Li and W. Trappe, "Collusion-resistant fingerprints from WBE sequence sets," In *Proceedings of the IEEE International Conference on Communications*, pg. 1336-1340, 2005.
94. W. Xu, W. Trappe, Y. Zhang, and T. Wood, "The Feasibility of Launching and Detecting Jamming Attacks in Wireless Networks," *Proceedings of the 6th ACM International Symposium on Mobile Ad Hoc Networking and Computing (Mobihoc05)*, pg. 46-57, 2005. **(Acceptance Rate: 14%)**
95. Z. Li, W. Trappe, Y. Zhang and B. Nath, "Robust Statistical Methods for Securing Wireless Localization in Sensor Networks," *Proceedings of the 4th International Symposium on Information Processing in Sensor Networks (IPSN05)*, pg. 91-98, 2005. **(Acceptance Rate: 20%)**
96. P. Kamat, Y. Zhang, W. Trappe and C. Ozturk, "Enhancing Source-Location Privacy in Sensor Network Routing," *Proceedings of the 25th IEEE Int. Conference on Distributed Computing Systems (ICDCS05)*, pg. 599-608, 2005. **(Acceptance Rate: 13%)**
97. W. Xu, T. Wood, W. Trappe and Y. Zhang, "Channel Surfing and Spatial Retreats: Defenses Against Wireless Denial of Service," *Proceedings of the 2004 ACM Workshop on Wireless Security*, pg. 80-89, 2004. **(Acceptance Rate: 20%)**
98. W. Xu, W. Trappe and S. Paul, "Key Management for 3G MBMS Security," *Proceedings of the IEEE Global Telecommunication Conference (Globecom)*, pg. 2276-2280, 2004.
99. C. Ozturk, Y. Zhang, W. Trappe, "Source-Location Privacy in Energy-Constrained Sensor Network Routing," *Proceedings of the 2nd ACM Workshop on Security of Ad hoc and Sensor Networks*, pg. 88-93, Oct. 2004.
100. Z. Li, Y. Zhang, W. Trappe and B. Nath, "Securing Wireless Localization: Living with Bad Guys," *2004 DIMACS Workshop on Mobile and Wireless Security*.
101. M. Wu, W. Trappe, Z. J. Wang, K.J.R. Liu, "Collusion Resistant Multimedia Fingerprinting: A Unified Framework," in *Proceedings of the SPIE-- The International Society for Optical Engineering*, pg. 748-759, 2004.
102. Z. J. Wang, M. Wu, H. Zhao, K.J.R. Liu and W. Trappe, "Resistance of Orthogonal Gaussian Fingerprints to Collusion Attacks," *Proceedings of the 2003 IEEE International Conference on Multimedia and Expo*, vol. 1, pg. 617-620, 2003.
103. Z. J. Wang, M. Wu, W. Trappe and K.J.R. Liu, "Anti-collusion of Group-oriented Fingerprinting," *Proceedings of the 2003 IEEE International Conference on Multimedia and Expo*, vol. 2, pg. 217-220, 2003.
104. M. Bohge and W. Trappe, "An Authentication Framework for Hierarchical Ad Hoc Sensor Networks," *Proceedings of the 2003 ACM Workshop on Wireless Security*, pg. 79-87, 2003. **(Acceptance Rate: 25%)**

105. C. Ozturk, Y. Zhang, W. Trappe and M. Ott, "Source-location privacy for networks of energy-constrained sensors," *Proceedings of 2nd IEEE Workshop on Software Technologies for Future Embedded and Ubiquitous Systems*, pg. 68-72, 2004.
106. Y. Sun, W. Trappe, K.J.R. Liu, "Topology-Aware Key Management for Wireless Multicast," *IEEE Globecom '03*, pg. 1471-1475, 2003.
107. W. Trappe, M. Wu, and K. J. R. Liu, "Joint Coding and Embedding for Collusion-Resistant Fingerprinting," *EUSIPCO 2002*, special session on Security Issues in Digital Watermarking.
108. W. Trappe, M. Wu, and K. J. R. Liu, "Anti-Collusion Codes: Multi-User and Multimedia Perspectives," *IEEE International Conference on Image Processing (ICIP)*, vol. 2, pg. 149-152, 2002.
109. W. Trappe, M. Wu, and K. J. R. Liu, "Collusion-Resistant Fingerprinting for Multimedia," *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*, vol. 4, pg. 3309-3312, 2002.
110. W. Trappe, Y. Wang, and K. J. R. Liu, "Establishment of Conference Keys in Heterogeneous Networks," *IEEE Int. Conference on Communications*, pg. 2201-2205, 2002.
111. Y. Sun, W. Trappe, and K. J. R. Liu, "An Efficient Key Management Scheme for Secure Wireless Multicast," *IEEE Int. Conference on Communications*, pg. 1236-1240, 2002.
112. B. Sun, W. Trappe, Y. Sun, and K.J.R. Liu, "A Time-Efficient Contributory Key Agreement Scheme for Secure Group Communication," *IEEE Int. Conf. on Communications*, pg. 1159-1163, 2002.
113. W. Trappe, J. Song, R. Poovendran, and K. J. R. Liu, "Key Distribution for Secure Multimedia Multicasts via Data Embedding," *IEEE Int. Conf. on Acoustics, Speech, and Signal Processing*, May 2001.
114. W. Trappe, Y. Wang, and K. J. R. Liu, "Group Key Agreement Using Divide-and-Conquer Strategies," *35th Conference on Information Sciences and Systems*, The Johns Hopkins University, March 2001.
115. J. Song, R. Poovendran, W. Trappe, and K. J. R. Liu, "A Dynamic Key Distribution Scheme Using Data Embedding for Secure Multimedia Multicast," *Proceedings of SPIE Security and Watermarking for Multimedia*, Vol. 4314, pg. 618-628, 2001.
116. W. Trappe and K. J. R. Liu. "Denoising via Adaptive Lifting Schemes," *Proceedings of SPIE Wavelet Applications in Signal and Image Processing VIII*, Vol. 4119, pg. 302-312, 2000 (Invited paper).
117. W. Trappe, H. Zheng, and K. J. R. Liu, "Adaptive Lifting Coding Scheme for Video Scene Changes," *IEEE Workshop on Multimedia Signal Processing*, September 1999.
118. W. Trappe and K. J. R. Liu, "Adaptivity in the Lifting Scheme," *33rd Annual Conference on Information Sciences and Systems*, The Johns Hopkins University, pg. 950-955, March 1999.
119. J. D. Lakey and W. Trappe, "Signal Analysis by Composite Wavelet Transforms," *Proc. Approximation Theory VIII*, World Scientific, 1996.
120. J. D. Lakey and W. Trappe, "Analysis of Chirp Signals by Time-Frequency Localization Frames," *Proceedings of SPIE Wavelet Applications in Signal and Image Processing IV*, Vol. 2825, pg. 551-560, 1996.

Miscellaneous:

1. W. Trappe, "No Need for Speed: More Signal Processing Innovation is Required Before Adopting Automated Vehicles," in *IEEE Signal Processing Magazine*, vol. 34, no. 2, pg. 122-124, 2017.
2. W. Trappe, "Data Treasure Hunters: Science Expanding to New Frontiers," in *IEEE Signal Processing Magazine*, vol. 34, no. 1, pg. 115-116, 2017.
3. Z.J. Wang, W. Trappe, S. Cui, "Brain Signal Analytics: Analytical Approaches to Enhanced Understanding of Brain Function (from the Editors)," in *IEEE Signal Processing Magazine*, vol. 3, pg. 12-13, 2016.
4. W. Trappe, V. Poor, H. Iwai, A. Yener, P. Prucnal, J. Barros, "Guest Editorial for Special Issue on Using the Physical Layer for Securing the Next Generation of Communication Systems," in *IEEE Trans. on Information Forensics and Security*, vol. 6, pg. 521-522, 2011.
5. W. Trappe, "Book Review for Fundamentals of Wireless Communications," in *IEEE Signal Processing Magazine*, vol. 23, pg. 134-138, 2006.

Patents:

1. S. Mathur, W. Trappe, A. Varshavsky, "Establishing Secure Links Between Wireless Devices in Proximity Using Ambient Wireless Signals," US Patent 8,873,755.
2. J. Song, W. Trappe, R. Poovendran and K. J. R. Liu, "A Dynamic Key Distribution Scheme Using Data Embedding for Secure Multimedia Multicast," U.S. and international patent application filed June 2001, PCT/US01/19715.
3. W. Trappe, Y. Zhang, W. Xu, K. Ma, "Repairing and Protecting Wireless and Sensor Networks from Interference through Spectral and Spatial Adaptation," Rutgers Invention Disclosure, submitted April 17, 2006.

Presentations and Lectures:

1. "Engineering Case Study/Workshop: Security by Design," Internet of Medical Things: Cybersecurity for Connected Devices Workshop, 2016.
2. "Security for Low-End IoT Devices: When Energy is Not Enough, What is One to Do?" Keynote, ACM Wireless Security Conference and RFIDSec, 2015.
3. "The Wireless Physical Layer: A Medium for Information Extraction and Exploitation," Keynote, IEEE ICC Workshop on Physical Layer Security, 2015.
4. "Security for Low-End Devices: When Energy is Not Enough, What is One to Do?" Keynote, IEEE Workshop on Information Forensics and Security, 2014.
5. "White Space Security: Securing our Spectral Resources," Institute for Defense and Government Analysis, 2011.
6. "Alice and Bob Get Physical: Introducing Physical Contexts into Security for the Future Internet," Niksun World Wide Security and Mobility Conference, 2011.
7. Wireless Security Lecture at the University of Illinois Wireless Summer School, 2009.
8. "Alice and Bob Get Physical: Insights into Physical Layer Security," Talk at the University of California at Berkeley Networking, Communications, and DSP Seminar.
9. "Securing Wireless Networks without Cryptography," Invited Seminar at the Wireless Engineering Research and Education Center, Auburn University, 2007.
10. "Opportunities for Multi-core Systems in the Future Wireless Internet," Invited Lecture at Advances in Networking for Multi-core Processors (MC NET), Intel, 2006.
11. "GENI Wireless Working Group," presented at the March 10, 2006 CRA-National Science Foundation's First Town Hall Meeting on GENI—Global Environment for Networking Innovations.
12. "Overview of Security and Privacy Research at WINLAB," presented at IBM Watson Research Laboratory, December 2005.
13. Co-taught the IEEE 2005 International Conference on Acoustics, Speech, and Signal Processing (ICASSP) Tutorial, "Digital Fingerprinting for Multimedia Forensics," held in Philadelphia, PA on March 19, 2005.
14. "ORBIT Wireless Testbed Initiative," presented at the 19th IEEE Annual Computer Communications Workshop, 2004.
15. "ORBIT: Open Access Research Testbed for Next Generation Wireless Networks," Coalition for National Science Funding 10th Annual Exhibition and Reception, SCIENCE@WORK.

Ph.D. Students Advised:

1. Wenyuan Xu, Associate Professor, University of South Carolina, NSF Career Award
2. Qing Li, Qualcomm
3. Pandurang Kamat, Ask.com
4. Yingying Chen, Professor, Rutgers University, NSF Career Award
5. Zang Li (co-advised with Roy Yates), Brocade
6. Liang Xiao (co-advised with Narayan Mandayam and Larry Greenstein), Professor, Xiamen University
7. Suhas Mathur (co-advised with Narayan Mandayam), Two Sigma (previously AT&T Labs)
8. Yu Zhang, Bloomberg

9. Michael Loiacono, Siemens
10. Aliye Ozge Kaya (co-advised with Larry Greenstein), Nokia Alcatel-Lucent
11. Brian Russell, Lecturer, Rutgers University
12. Robert Miller, Applied Communication Sciences (formerly Telcordia)
13. Shu Chen, Ask.com
14. Song Liu (co-advised with Larry Greenstein), Apple
15. Rishabh Dudheria
16. Shweta Sagari
17. Xiruo Liu, Intel
18. Y. Liu

Wade Trappe received his B.A. in Mathematics from The University of Texas at Austin in 1994 and his Ph.D. in Applied Mathematics and Scientific Computing from the University of Maryland in 2002. He is currently a Professor in the Electrical and Computer Engineering Department at Rutgers University, and Associate Director of the Wireless Information Network Laboratory (WINLAB), where he directs WINLAB's research in wireless security.