Dennis L. Goeckel

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Education

University of Michigan, Ann Arbor, MI 1992-1996

Ph. D. (Electrical Engineering: Systems) August 1996.
Major: Communications Minor: Signal Processing
Dissertation: "Performance Limits and Optimal Resource Allocation for Coded Multi-User Communication Systems." Advisor: Prof. Wayne E. Stark

M.S. (Electrical Engineering) December 1993.

Purdue University, West Lafayette, IN 1987-1992

B.S. (Computer and Electrical Engineering), with highest distinction, May 1992.

Research/Industrial Experience

University of Massachusetts 1996-present

(currently) Professor, Electrical and Computer Engineering Department

• Research: Conducting research on: (1) communications and networking, often for wireless systems, and, (2) signal processing, in particular for radar systems.

• Teaching: Undergraduate courses in probability and random processes, communication systems. Graduate courses in both basic and advanced digital communication theory, statistical signal processing.

• Consulting: Consultant with Quadrant Engineering, Inc. (1998-2000), M/A-COM, Inc. (2000-2005, 2007), and Mabuhay Networks (2001) on signal processing and communication theory topics.

University of Michigan 1992-1996

Rackham Pre-Doctoral Fellow, 1995-1996. Conducted research on equalization, interference suppression, and optimal system specifications for multi-user wireless communication systems.

National Science Foundation Graduate Fellow, 1992-1995. Conducted research in communication and signal processing techniques with emphasis on the application of these techniques to wireless communication systems.

Sundstrand Corporation, *Co-op Engineer* 1988-1992

Honors and Professional Activities

IEEE Fellow (effective January 1, 2011).

University of Massachusetts Distinguished Teaching Award (3 winners campus-wide each academic year, can only be won once per lifetime), 2007.

National Science Foundation CAREER Award (1999).

Keynote Address, International Workshop on Wireless Physical Layer Security, May 2016.

QualComm Distinguished Lecturer, International Conference on Networking and Communications, February 2014.

Honorable Mention, NSA Best Scientific Cybersecurity Paper Competition (co-author), 2016.

Associate Editor for the *IEEE/ACM Transactions on Networking,* 2012-2016.

Outstanding Senior Faculty Member, College of Engineering, University of Massachusetts (2010).

Associate Editor for the *IEEE Transactions on Mobile Computing,* 2010-2013.

Lead Co-Chair, Technical Program Committee of the Wireless Communications Theory Symposium of the IEEE Global Communications Conference (2008).

Guest Editor, *IEEE Journal on Selected Topics in Signal Processing: Special Issue on Performance Limits of Ultra-Wideband Systems,* October 2007.

Associate Editor for the *IEEE Transactions on Communications,* 2006-2010.

College Outstanding Teacher, College of Engineering, University of Massachusetts (2005-2006).

Visiting Scientist, Laboratory for Information and Decision Sciences (LIDS), Massachusetts Institute of Technology (MIT), 2004-2005.

Technical Program Co-Chair (one of four equal co-chairs), Communication Theory Symposium of the IEEE Global Communications Conference (2004).

Outstanding Junior Faculty Member (shared with Jim Watkins), College of Engineering, University of Massachusetts (2001).

Faculty Speaker (selected by students), first annual Engineering Commencement Ceremony, 2001.

Lilly Teaching Fellow (2000-2001).

Associate Editor for the *IEEE Journal on Selected Areas in Communications: Wireless Communication Series* (later *IEEE Transaction on Wireless Communications*), 1999-2002.

Frequent Panelist for the National Science Foundation.

Reviewer for *IEEE Transactions on Communications, IEEE Transactions on Signal Processing*, *IEEE Transactions on Wireless Communications, European Transactions on Telecommunications, IEEE Journal on Selected Areas in Communications*, *IEEE/ACM Transactions on Networking*, *IEEE Transactions on Information Theory*, *IEEE Communication Letters,* National Science Foundation, and various international equivalents (Canada, Israel, Qatar, etc.)

Advisor to the IEEE Student Chapter at the University of Massachusetts, 1996-2008.

Technical Program Committee Member, Organizer, and/or Session Chair for Communication Theory at various conferences.

University of Massachusetts ECE Outstanding Advisor Award (1999, 2000) and University of Massachusetts ECE Outstanding Faculty Award (2001,2003,2013,2014) (selected by graduating students),

Rackham Pre-Doctoral Fellowship (1995-1996).
University of Michigan fellowship awarded to 60 students university-wide. Interdisciplinary panels select recipients from candidates nominated by their respective departments.

National Science Foundation Pre-Doctoral Fellowship (1992-1995).

Externally Funded Research Grants/Contracts

Robust Adaptive Coded Modulation for Time-Varying Channels (sole-PI)

Funding source: National Science Foundation 1/15/98-12/31/00

Amount: $241,399 (with REU Supplement)

CAREER: Coded Modulation for High-Speed Wireless Communications (sole-PI)

Funding source: National Science Foundation 7/1/99-6/30/04

Amount: $200,000

Single Carrier (VSB) versus Multi-Carrier (COFDM) Modulation for Digital Terrestrial Broadcast Applications in the United States (sole-PI)

Funding Source: Association for Maximum Service Television 11/1/99-12/31/00

Amount: $25,500 ($3,500 subcontract **to** General Electric Corporate R&D)

Analog Devices Graduate Fellowship at UMass-Amherst (sole-PI)

Funding source: Analog Devices, Inc. 1/1/00-12/31/01, 9/1/01-8/31/03

Amount: $100,000

Element Location Measurement for Millimeter Wave Airborne Antenna (PI: Goeckel, Co-PI: Frasier)

Funding Source: Quadrant Engineering, Inc. 6/01/00-7/15/01

Amount: $74,136

Antenna Array Calibration Algorithms for Millimeter Wave, Airborne Antennas (PI: Goeckel, Co-PI: Frasier)

Funding Source: DARPA (sub-contract from Quadrant Engineering) 12/01/00-8/31/01

Amount: $74,318

Broadband Wireless Access: Design and Construction (PI: Goeckel, Co-PI: Jackson, Co-PI: Pozar)

Funding Source: Narad Networks, Inc. 9/01/00-12/31/01

Amount: $95,367

Research Infrastructure: Infrastructure to Support Research on Mixed Wired/Wireless Information Systems (PI: Towsley, Co-PI: Adler, Co-PI: Ganz, Co-PI: Goeckel, Co-PI: Shenoy, ten total senior personnel)

Funding Source: National Science Foundation 9/15/00-8/31/05

Amount: $992,585

Multidisciplinary University Research Initiative (MURI): Short-Range Ultra-Wideband Systems (PI: Schaubert, Co-PI: Goeckel, Co-PI: Pozar)

Funding Source: Army Research Office (sub-contract from USC) 5/01/01-8/31/06

Amount: $1,482,753

Orthogonal Frequency Division Multiplexing Systems (sole-PI)

Funding Source: Mabuhay Networks 8/09/01-8/08/02

Amount: $13,500

Signal Processing for Radar and Communication Systems (sole-PI)

Funding Source: M/A-COM, Inc. 10/01/01-8/31/02

Amount: $35,000

Space Time Codes for Antenna Diversity (sole-PI)

Funding Source: M/A-COM, Inc. 10/01/02-9/30/03

Amount: $36,000

Propagation and Capacity Studies for Multi-Polarized MIMO Communication Systems (PI: Janaswamy, Co-PI: Goeckel)

Funding Source: National Science Foundation 6/01/03-5/31/06

Amount: $299,999

Center for Collaborative Adaptive Sensing of the Atmosphere (CASA) (one of many, many senior personnel spread across four universities)

Funding Source: National Science Foundation 9/01/03-8/31/08

Amount: $17,000,000

Next Generation Wireless Communication Systems (sole-PI)

Funding Source: Analog Devices, Inc. 5/01/04-12/31/09

Amount: $222,889

Simulation of Communication Systems (sole-PI)

Funding Source: M/A-COM, Inc. 9/01/04-8/30/07

Amount: $126,000

Macroscopic Space-Time Codes for Homeland Security (sole-PI)

Funding Source: National Science Foundation (with M/A-COM matching) 9/01/04-8/31/06

Amount: $57,034

Implementation of Communication Systems (PI: Goeckel, Co-PI: Tessier)

Funding Source: M/A-COM, Inc. 9/01/06-8/30/07

Amount: $20,000

MIMO System Implementation (sole-PI)

Funding Source: M/A-COM, Inc. 2/15/07-6/15/07

Amount: $17,000

Low Data Rate Frequency-Shifted Reference Ultra-Wideband (UWB) Communication Systems - Phase I (PI: Goeckel, Co-PI: Jackson)

Funding Source: Army Research Office (sub-contract from NewLANs) 7/23/07-1/22/08

Amount: $60,000

Cooperative Networking (PI: Towsley, Co-PI: Goeckel, Co-PI: Kurose)

Funding Source: Army Research Laboratory (sub-contract from IBM) 3/11/07-5/11/09

Amount: $655,000

Cooperative Wireless Networking: Foundations and Practice (PI: Towsley, Co-PI: Goeckel)

Funding Source: National Science Foundation 9/01/07-8/31/10

Amount: $350,001

Frequency-Shifted Reference Ultra-Wideband (UWB) Communications (sole-PI)

Funding Source: National Science Foundation 9/01/07-8/31/10

Amount: $373,592 (with GRS, REU supplements)

Sphere Decoding in MIMO Systems (sole-PI)

Funding Source: M/A-COM, Inc. 12/31/07-11/30/08

Amount: $91,220

Ultra-Wideband Radio for Low-Power Security (PI:Burleson, Co-PI: Goeckel, Co-PI: Jackson)

Funding Source: National Science Foundation 9/01/08-8/31/10

Amount: $200,000

Low Data Rate Frequency-Shifted Reference Ultra-Wideband (UWB) Communication Systems (Phase II) (PI: Jackson, Co-PI: Goeckel)

Funding Source: Army Research Office (sub-contract from NewLANs) 9/25/08-10/24/10

Amount: $231,755

IBM-ITA: Performance Limits of Collaborative Wireless Networks (PI: Towsley, Co-PI: Goeckel, Co-PI: Kurose)

Funding Source: Army Research Laboratory (sub-contract from IBM) 5/12/09-5/11/11

Amount: $826,109

Novel Forensic Analysis for Crimes Involving Mobile Systems (PI: Levine, Co-PI: Goeckel)

Funding Source: National Science Foundation 9/01/09-8/31/14

Amount: $777,620.

Design and Initialization of Secure Wireless Networks: Foundations and Practice (PI: Towsley, Co-PI: Goeckel)

Funding Source: National Science Foundation 9/01/10-8/31/14

Amount: $425,000.

IBM-ITA: Performance Limits of Collaborative Wireless Networks (PI: Towsley, Co-PI: Goeckel, Co-PI: Kurose)

Funding Source: Army Research Laboratory (sub-contract from IBM) 5/12/11-5/11/13

Amount: $848,358

Robust Active Compressive Sensing: Circuits and Algorithms (PI: D. Goeckel, Co-PI: M. Duarte, Co-PI: B. Jackson)

Funding Source: National Science Foundation 5/1/12-4/30/16

Amount: $356,570

EAGER: Everlasting Security in Disadvantaged Wireless Environments, (sole-PI)

Funding Source: National Science Foundation 9/1/12-8/31/14

Amount: $141,939.

Low Probability of Detection Wireless Communications (PI: Goeckel, Co-PI: Towsley)

Funding Source: National Science Foundation 9/01/13-8/31/16

Amount: $374,724 ($80K sub-contract to Raytheon BBN).

Everlasting Security for Disadvantaged Wireless Communications (PI: Goeckel, Co-PI: Pishro-Nik)

Funding Source: National Science Foundation 9/01/14-8/31/19

Amount: $504,422

High Dynamic Range Wideband Reconfigurable Receivers (PI: Bardin, Co-PI: Duarte, Co-PI: Goeckel, Co-PI: Jackson)

Funding Source: National Science Foundation 1/01/16-12/31/20

Amount: $649,199

Quantum-secured Imperceptible and unExploitable communication and sensing Technologies (QUIET) (PI: Goeckel, Co-PI: Towsley)

Funding Source: DARPA (via subcontract from Raytheon BBN) 7/22/16-4/11/17

Amount: $94,980

Limits and Algorithms for Covert Communications (PI: Towsley, Co-PI: Goeckel, Co-PI: Houmansadr)

Funding Source: National Science Foundation 8/01/16-7/31/20

Amount: $1,198,781

A Unified Framework for IoT Privacy (PI: Pishro-Nik, Co-PI: Goeckel, Co-PI: Houmansadr)

Funding Source: National Science Foundation 9/01/17-7/31/22

Amount: $999,955

Exploiting Co-Existence for Verifiable Everlasting Security in Wireless Communication Systems: Hardware and Protocols (PI: Goeckel, Co-PI: Jackson)

Funding Source: National Science Foundation 9/15/20-8/31/23

Amount: $449,998

Robust Covert Wireless Communications (PI: Goeckel, Co-PI: Houmansadr, Co-PI: Towsley)

Funding Source: National Science Foundation 3/1/22-2/28/25

Amount: $499,795

Publications

Theses/Dissertations Advised

G. Ananthaswamy, *Ph.D. Dissertation: Coded Modulation and Equalization for Highly Bandwidth Efficient Communication on Broadband Wireless Channels,* April 2001.

R. Zhao (co-chair with P. Kelly), *Ph.D. Dissertation: Iterative Posterior Probability Estimation, Optimal Filtering, and Object Detection,* March 2003.

S. Wei, *Ph.D. Dissertation: Convergence Results on Broad-band Wireless Communication Systems and Their Implications,* May 2003.

Q. Zhang, *Ph.D. Dissertation: Slightly Frequency-Shifted Reference Ultra-Wideband (UWB) Communications,* August 2006.

H. Zhang, *Ph.D. Dissertation: Rapid Acquisition of Ultra-Wideband Radio Signals and Implementation Issues of Closed-loop Multiple-Antenna Systems,* September 2007.

Y. Hao, *Ph.D. Dissertation: Communications and Radar Signal Processing from Multiple Base Stations,* September 2007.

K. Liu, *Ph.D. Dissertation: Peak-to-average Power Ratio Reduction in WCDMA Systems and Cooperative Group Transmission in Sensor Networks,* September 2007.

A. Polak, *Ph.D. Dissertation: Signal Processing in Wireless Communications: Device Fingerprinting and Wide-Band Interference Rejection,* September 2014.

C. Capar, *Ph.D. Dissertation: Asymptotic Analysis of Random Wireless Networks: Broadcasting, Secrecy, and Hybrid Networks,* September 2014.

K. Morrison, *Ph.D. Dissertation: Receiver Design and Security for Low Power Wireless Communications Systems,* September 2014.

A. Sheikholeslami (co-chair with H. Pishro-Nik), *Ph.D. Dissertation: Everlasting Secrecy by Exploiting Eavesdropper's Receiver Non-Idealities,* February 2016.

T. Sobers (co-chair with P. Kelly), *Ph.D. Dissertation: Covert Wireless Communications in a Dynamic Environment,* May 2017.

R. Soltani, *Ph.D. Dissertation: Fundamental Limits of Covert Communication in Packet Channels, December 2018.*

K. Li, *Ph.D. Dissertation: Covert Communications in Continuous-Time Systems,* May 2021.

C. Kose, *M.S. Thesis: Optimal Adaptive Transmitter and Receiver Techniques,* September 2000.

P. Ormeci, *M.S. Thesis: Adaptive Coded Modulation for Fading Channels,* September 2000.

K. Kamath, *M.S. Thesis: Minimizing Outage in Adaptive Signaling Systems,* September 2001.

B. Kwak, *M.S. Thesis: On the Performance Evaluation of Coded OFDM Systems,* January 2003.

A. Mehrabi, *M.S. Thesis: Non-Coherent Macroscopic Space-Time Block Codes,* August 2005.

S. Song, *M.S. Thesis: On the Asymptotic Connectivity Properties of Collaborative Ad Hoc Networks,* August 2005.

S. Li, *M.S. Thesis: Surface Refractive Index Field Estimation by Factor Graph,* August 2006.

L. Wang, *M.S. Thesis: Connectivity in Cooperative Wireless Ad Hoc Networks,* May 2007.

A. Menon, *M.S. Thesis: Power Amplifier Linearization and Implementation,* September 2007.

C. Capar, *M.S. Thesis: Radar Waveform Design for Classification and Linearization of Digital-to-Analog Converters,* August 2008.

S. Dolatshahi (co-chair with Hossein Pishro-Nik), *M.S. Thesis: Information Theoretic Identification and Compensation of Nonlinear Devices,* August 2009.

H. Joshi, *M.S. Thesis: Receiver Optimization for Frequency Shifted Reference UltraWideband Radio Systems and Compensation of Nonlinear Devices,* March 2010.

M. Ko, *M.S. Thesis: Wireless Physical-Layer Security Performance of UWB Systems,* September 2011.

L. Wang, *M.S. Thesis: Addressing/Exploiting Transceiver Imperfections in Wireless Communication Systems,* September 2011.

T. Peyyeti, *M.S. Thesis: Interference Cancellation in Wideband Receivers Using Compressive Sensing,* December 2012.

A. Rakshan, *M.S. Thesis: Capturing Successive Interference Cancellation in a Joint Routing and Scheduling Algorithm for Wireless Communication Networks,* December 2012.

R. Talat, *M.S. Thesis: Enhancing Secrecy via Exploring Randomness in the Wireless Physical Layer,* August 2013.

X. Chen, *M.S. Thesis: Resource Allocation and Pricing in Virtual Wireless Networks,* December 2013.

H. Huang, *M.S. Thesis: Post Hoc Indoor Localization Based on RSS Fingerprint in WLAN,* December 2013.

Refereed Journal Articles

[78] B. Guan, N. Takbiri, D. Goeckel, A. Houmansadr, and H. Pishro-Nik, "Superstring-Based Sequence Obfuscation to Thwart Pattern Matching Attacks," revision submitted to *IEEE Internet of Things (IoT) Journal,* March 2022.

[78] A. Bozorgi, A. Bahramali, F. Rezaei, A. Houmansadr, R. Soltani, D. Goeckel, and D. Towsley, "I Still Know What You Did Last Summer: Inferring Sensitive User Activities on Messaging Applications Through Traffic Analysis," submitted to the *IEEE Transactions on Dependable and Secure Computing,* February 2021.

[77] K. Li, T. Sobers, D. Towsley, and D. Goeckel, "Covert Communication in Continuous-Time Systems in the Presence of a Jammer," accepted to appear, *IEEE Transactions on Wireless Communications,* November 2021.

[76] A. Sheikholeslami, M. Ghaderi, and D. Goeckel, "Covert Communications in Multi-Channel Slotted ALOHA Systems," *IEEE Transactions on Mobile Computing,* Vol. 21: pp. 1958-1971, June 2022.

[75] M. Forouzesh, P. Azmi, N. Mokari, and D. Goeckel, "Robust Power Allocation in Covert Communication: Imperfect CDI," *IEEE Transactions on Vehicular Technology,* Vol. 6: pp. 5789-5802, June 2021.

[74] N. Takbiri, M. Chen, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Asymptotic Privacy Loss in Time Series Matching for the Dependent Users," *IEEE Communications Letters,* Vol. 25: pp. 1079-1083, April 2021.

[73] M. Shifrin, D. Menasche, A. Cohen, O. Gurewitz, and D. Goeckel, "Optimal PHY Configuration in Wireless Networks," *IEEE/ACM Transactions on Networking,* Vol. 28: pp. 2601-2614, December 2020.

[72] R. Soltani, D. Goeckel, D. Towsley, and A. Houmansadr, "Fundamental Limits of Invisible Flow Fingerprinting," *IEEE Transactions on Information Forensics & Security*, Vol. 15: pp. 345-360, December

2020.

[71] N. Takbiri, V. Shejwalkar, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Leveraging Prior Knowledge Asymmetries in the Design of Location Privacy-Preserving Mechanisms," *IEEE Wireless Communication Letters,* Vol. 9: pp. 2005-2009, November 2020.

[70] N. Takbiri, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Privacy of Dependent Users Against Statistical Matching," *IEEE Transactions on Information Theory,* Vol. 66: pp. 5842-5865, September 2020.

[69] M. Forouzesh, P. Azmi, N. Mokari, and D. Goeckel, "Covert Communication Using Null Space and 3D Beamforming: Uncertainty of Willies Location Information," *IEEE Transactions on Vehicular Technology,* Vol. 69: pp. 8568-8576, August 2020.

[68] R. Soltani, D. Goeckel, D. Towsley, and A. Houmansadr, "Fundamental Limits of Covert Packet Insertion," *IEEE Transactions on Communications,* Vol. 68: pp. 3401-3414, June 2020.

[67] K. Li, P. Kelly, and D. Goeckel, "Optimal Power Adaptation in Covert Communication with an Uninformed Jammer," *IEEE Transactions on Wireless Communications,* Vol. 19: pp. 3464-3473, May 2020.

[66] N. Takbiri, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Matching Anonymized and Obfuscated Time Series to Users' Profiles," *IEEE Transactions on Information Theory,* Vol. 65: pp. 724-741, February 2019.

[65] R. Soltani, D. Goeckel, D. Towsley, B. Bash, and S. Guha, "Covert Wireless Communication with Artificial Noise Generation," *IEEE Transactions on Wireless Communications,* Vol. 17: pp. 7252-7267, November 2018.

[64] A. Sheikholeslami, M. Ghaderi, D. Towsley, B. Bash, S. Guha, and D. Goeckel, "Multi-Hop Routing in Covert Wireless Networks," *IEEE Transactions on Wireless Communications,* Vol. 17: pp. 3656-3669, June 2018.

[63] A. Polak, M. Wagner, M. Duarte, D. Goeckel, and R. Jackson, "Mitigation of spectral leakage for single carrier, block-processing cognitive radio receivers," *(Elsevier) Digital Communications and Networks,* Vol. 4: pp. 106-110, April 2018.

[62] T. Sobers, B. Bash, S. Guha, D. Towsley, and D. Goeckel, "Covert Communication in the Presence of an Uninformed Jammer," *IEEE Transactions on Wireless Communications,* Vol. 16: pp. 6193-6206, September 2017.

[61] A. Sheikholeslami, M. Ghaderi, H. Pishro-Nik, and D. Goeckel, "Energy-Efficient Secrecy in Wireless Networks Based on Random Jamming," *IEEE Transactions on Communications,* Vol. 65: pp. 2522-2533, June 2017.

[60] B. Bash, D. Goeckel, and D. Towsley, "Adversarys Ignorance of Transmission Time Increases Covert Throughput," *IEEE Transactions on Wireless Communications,* Vol. 15: pp. 8394-8405, December 2016.

[59] A. Sheikholeslami, M. Ghaderi, H. Pishro-Nik, and D. Goeckel, "Energy-Efficient Routing in Wireless Networks in the Presence of Jamming," *IEEE Transactions on Wireless Communications,* Vol. 15: pp. 6828-6842, October 2016.

[58] A. Seetharam, J. Kurose, and D. Goeckel, "A Markovian Model for Coarse Timescale Channel Variation in Wireless Networks," *IEEE Transactions on Vehicular Technology,* Vol. 65: pp. 1701-1710, March 2016.

[57] D. Goeckel, B. Bash, S. Guha, and D. Towsley, "Covert Communications when the Warden Does Not Know the Background Noise Power," *IEEE Communication Letters,* Vol. 20: pp. 236-239, February 2016.

[56] A. Polak and D. Goeckel, "Wireless Device Identification Based on RF Oscillator Imperfections," *IEEE Transactions on Information Forensics & Security,* Vol. 10: pp. 2492-2501, December 2015.

[55] B. Bash, D. Goeckel, D. Towsley, and S. Guha, "Hiding Information in Noise: Fundamental Limits

of Covert Wireless Communication," *IEEE Communications Magazine: Special Issue on Wireless Physical Layer Security,* Vol. 53, pp. 26-31, December 2015.

[54] A. Sheikholeslami, D. Goeckel, and H. Pishro-Nik, "Jamming Based on an Ephemeral Key to Obtain Everlasting Security in Wireless Environments," *IEEE Transactions on Wireless Communications,* Vol. 14: pp. 6072-6081, November 2015.

[53] A. Polak and D. Goeckel, "Identification of Wireless Users Who Actively Fake Their RF Fingerprints with Artificial Distortion," *IEEE Transactions on Wireless Communications,* Vol. 14: pp. 5889-5899, November 2015.

[52] B. Bash, A. Gheorghe, M. Patel, J. Habif, D. Goeckel, D. Towsley, and S. Guha, "Quantum-secure Covert Communication on Bosonic Channels," *Nature Communications,* October 19, 2015. (*Honorable Mention, NSA Best Scientific Cybersecurity Paper Competition, 2016*)

[51] M. Ghaderi, D. Goeckel, A. Orda, and M. Dehghan, "Minimum Energy Routing and Jamming to Thwart Wireless Network Eavesdroppers," *IEEE Transactions on Mobile Computing,* Vol. 14: pp. 1433-1448, July 2015.

[50] A. Polak, M. Duarte, and D. Goeckel, "Performance Bound for Grouped Incoherent Measurements in Compressive Sensing," *IEEE Transactions on Signal Processing,* Vol. 63: pp. 2877-2887, June 2015.

[49] A. Sheikholeslami, D. Goeckel, and H. Pishro-Nik, "Everlasting Secrecy by Exploiting Non-Idealities of the Eavesdropper's Receiver," *IEEE Journal on Selected Areas in Communications: Special Issue on Signal Processing Techniques for Wireless Physical Layer Security,* Vol. 31: pp. 1828-1839, September 2013.

[48] B. Bash, D. Goeckel, and D. Towsley, "Limits of Reliable Communication with Low Probability of Detection on AWGN Channels," *IEEE Journal on Selected Areas in Communications: Special Issue on Signal Processing Techniques for Wireless Physical Layer Security,* Vol. 31: pp. 1921-1930, September 2013.

[47] C. Capar, D. Goeckel, and D. Towsley, "Broadcast in Cooperative Wireless Networks," *IEEE Transactions on Information Theory,* Vol. 59: pp. 5805-5810, September 2013.

[46] B. Bash, D. Goeckel, and D. Towsley, "Asymptotic Optimality of Equal Power Allocation for the Estimation of WSS Random Processes," *IEEE Wireless Communication Letters,* Vol. 2: pp. 247-250, June 2013.

[45] W. Wei, T. He, C. Bisdikian, D. Goeckel, B. Jiang, L. Kaplan, and D. Towsley, "Impact of In-Network Aggregation on Target Tracking Quality under Network Delays," *IEEE Journal on Selected Areas in Communications: Special Issue on In-Network Computation: Exploring the Fundamental Limits,* Vol. 31: pp. 808-818, April 2013.

[44] C. Capar, D. Goeckel, K. Paterson, E. Quaglia, D. Towsley, and M. Zafer, "Signal-Flow-Based Analysis of Wireless Security Protocols," *Information and Computation: Special Issue on Information Security as a Resource,* Vol. 226: pp. 37-56, April 2013.

[43] S. Vasudevan, M. Adler, D. Goeckel, and D. Towsley, "Efficient Algorithms for Neighbor Discovery in Wireless Networks," *IEEE/ACM Transactions on Networking,* Vol. 21: pp. 69-83, February 2013.

[42] M. Dehghan, D. Goeckel, M. Ghaderi, and Z. Ding, "Energy Efficiency of Cooperative Jamming Strategies in Secure Wireless Networks," *IEEE Transactions on Wireless Communications,* Vol. 11: pp. 3025-3029, September 2012.

[41] K. Morrison, C. Capar, and D. Goeckel, "Peak Minimization For Reference-Based Ultra-Wideband (UWB) Radio," *IEEE Transactions on Communications,* Vol. 60: pp. 2054-2058, August 2012.

[40] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "On the Application of Cooperative Transmission to

Secrecy Communications," *IEEE Journal on Selected Areas in Communications: Special Issue on Cooperative Networking: Challenges and Applications,* Vol. 30: pp. 359-368, February 2012.

[39] D. Goeckel, S. Vasudevan, D. Towsley, S. Adams, Z. Ding, and K. Leung, "Artificial Noise Generation from Cooperative Relays for Everlasting Security in Two-Hop Wireless Networks," *IEEE Journal on Selected Areas in Communications: Special Issue on Advances in Military Communications and Networking,* Vol. 29: pp. 2067-2076, December 2011.

[38] M. Dehghan, M. Ghaderi, and D. Goeckel, "Minimum-Energy Cooperative Routing in Wireless Networks with Channel Variations," *IEEE Transactions on Wireless Communications,* Vol. 10: pp. 3813-3823, November 2011.

[37] A. Polak, S. Dolatshahi, and D. Goeckel, "Identifying Wireless Users via Transmitter Imperfections," *IEEE Journal on Selected Areas in Communications - Special Issue on Advances in Digital Forensics for Communications and Networking,* Vol. 29: pp. 1469-1479, August 2011.

[36] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "Opportunistic Relaying for Secrecy Communications: Cooperative Jamming vs Relay Chatting," *IEEE Transactions on Wireless Communications,* Vol. 10: pp. 1725-1729, June 2011.

[35] B. Leow, Z. Ding, K. Leung, and D. Goeckel, "On the Study of Analogue Network Coding For Multi-Pair, Bidirectional Relay Channels," *IEEE Transactions on Wireless Communications,* Vol. 10: pp. 670-681, February 2011.

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