

## Dennis L. Goeckel

### **Office:**

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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).

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 9/01/14-8/31/17

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 1/01/16-12/31/18

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 8/01/16-7/31/19

Amount: \$1,198,781

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

Funding Source: National Science Foundation 9/01/17-7/31/20

Amount: \$999,955

## **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, *Ph.D. Dissertation: Covert Wireless Communications in a Dynamic Environment*, May 2017.

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

[67] R. Soltani, D. Goeckel, D. Towsley, B. Bash, and S. Guha, "Covert Wireless Communication with Artificial Noise Generation," submitted to the *IEEE Transactions on Wireless Communications*, September 2017.

[66] N. Takbiri, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Matching Anonymized and Obfuscated Time Series to Users' Profiles," submitted to the *IEEE Transactions on Information Theory*, September 2017.

[65] A. Sheikholeslami, M. Ghaderi, D. Towsley, B. Bash, S. Guha, and D. Goeckel, "Multi-Hop Routing in Covert Wireless Networks," submitted to the *IEEE Transactions on Wireless Communications*, August 2017.

[64] A. Sheikholeslami, B. Bash, D. Towsley, D. Goeckel, and S. Guha, "Covert Communication over Classical-Quantum Channels," submitted to the *IEEE Transactions on Information Theory*, June 2017.

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

[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, "Adversary's 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.

[34] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "Cooperative Transmission Protocols for Wireless Broadcast Channels", *IEEE Transactions on Wireless Communications*, Vol. 9: pp. 3701-3713, December 2010.

[33] S. Wei, D. Goeckel, and P. Kelly, "The Complex Envelope of a Bandlimited OFDM Signal Converges Weakly to a Gaussian Random Process," *IEEE Transactions on Information Theory*, Vol. 56: pp. 4893-4904, October 2010.

[32] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "A Relay Assisted Cooperative Transmission Protocol for Wireless Multiple Access Systems," *IEEE Transactions on Communications*, Vol. 58: pp. 2425-2435, August 2010.

[31] H. Liu, A. Molisch, D. Goeckel, and P. Orlik, "Hybrid Coherent and Frequency-Shifted-Reference Ultrawideband Radio," (*Elsevier*) *Physical Communication Journal: Special Issue on Advances in Ultra-Wideband Wireless Communications*, Vol. 2: pp. 265-273, December 2009.

[30] J. Xu, D. Goeckel, and R. Janaswamy, "The Capacity of MIMO Systems with Increasing SNR by Electromagnetic Analysis," *IEEE Transactions on Wireless Communications*, Vol. 8: pp. 4752-4761, September 2009.

[29] D. Goeckel, B. Liu, D. Towsley, L. Wang, and C. Westphal, "Asymptotic Connectivity Properties of Cooperative Wireless Ad Hoc Networks," *IEEE Journal on Selected Areas in Communications: Special Issue on Stochastic Geometry and Random Graphs for the Analysis and Design of Wireless Networks*, Vol. 27: pp. 1226-1237, September 2009.

[28] J. Liu, D. Goeckel, and D. Towsley, "Bounds on the Throughput Gain of Network Coding in Unicast and Multicast Wireless Networks," *IEEE Journal on Selected Areas in Communications: Special Issue on Network Coding for Wireless Networks*, Vol. 27: pp. 582-592, June 2009.

- [27] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "On the Study of Network Coding with Diversity," *IEEE Transactions on Wireless Communications*, Vol. 8: pp. 1247-1259, March 2009.
- [26] H. Zhang, S. Wei, G. Ananthaswamy, and D. Goeckel, "Adaptive Signaling under Statistical Measurement Uncertainty in Wireless Communications," *Proceedings of the IEEE*, Vol. 95: pp. 2337-2353, December 2007.
- [25] H. Zhang and D. Goeckel, "Peak Power Reduction in Closed-Loop MIMO-OFDM Systems via Mode Reservation," *IEEE Communication Letters*, Vol. 11: pp. 583-585, July 2007.
- [24] D. Goeckel and Q. Zhang, "Slightly Frequency-Shifted Ultra-Wideband (UWB) Radio," *IEEE Transactions on Communications*, Vol. 55: pp. 508-519, March 2007.
- [23] A. Scaglione, D. Goeckel, and J. Laneman, "Cooperative Communications in Mobile Ad-Hoc Networks: Rethinking the Link Abstraction," *IEEE Signal Processing Magazine: Special Issue on Signal Processing for Ad hoc Communication Networks*, Vol. 23: pp. 18-29, September 2006.
- [22] D. L. Goeckel and J. B. Mead, "Linear Filtering Approaches for Self-Calibration of Airborne Arrays," *IEEE Transactions on Aerospace and Electronic Systems*, Vol. 42: pp. 806-824, July 2006.
- [21] S. Wei, D. L. Goeckel, and M. Valenti, "Asynchronous Cooperative Diversity," *IEEE Transactions on Wireless Communications*, Vol. 5: pp. 1547-1557, June 2006.
- [20] Y. Hao, D. Goeckel, R. Janaswamy, and S. Frasier, "Surface Refractive Index (RI) Field Estimation from Multiple Radars," *Radio Science*, American Geophysical Union (AGU), Vol. 41, June 2006 (18 pages).
- [19] H. Zhang, S. Wei, D. Goeckel, and M. Win, "Rapid Hybrid Acquisition of Ultra-Wideband Signals," *Journal of VLSI Signal Processing: Special Issue on Ultra-Wideband Radio*, Kluwer Publishers, Vol. 43, pp. 7-23, April 2006.
- [18] S. Wei, D. L. Goeckel, and R. Janaswamy, "On the Asymptotic Capacity of MIMO Systems with Antenna Arrays of Fixed Length," *IEEE Transactions on Wireless Communications*, Vol. 4: pp. 1608-1621, July 2005.
- [17] R. Tessier, S. Swaminathan, R. Ramaswamy, D. Goeckel, and W. Burlison, "A Reconfigurable, Power-Efficient Adaptive Viterbi Decoder," *IEEE Transactions on VLSI Systems*, Vol. 13: pp. 484-488, April 2005.
- [16] K. Kamath and D. L. Goeckel, "Adaptive Modulation Schemes for Minimum Outage Probability in Wireless Systems," *IEEE Transactions on Communications*, Vol. 52: pp. 1632-1635, October 2004.
- [15] W. Burlison, R. Tessier, D. Goeckel, S. Swaminathan, P. Jain, J. Euh, S. Venkatraman, and V. Thyagaran, "Dynamically Parameterized Algorithms and Architectures to Exploit Signal Variations for Improved Performance and Reduced Power," *Journal of VLSI Signal Processing: Special Issue on Reconfigurable Computing*, Kluwer Publishers, Vol. 36: pp. 27-40, January 2004.
- [14] S. Wei and D. L. Goeckel, "On the Minimax Robustness of the Uniform Transmission Power Strategy in MIMO Systems," *IEEE Communication Letters*, Vol. 7: pp. 523-524, November 2003.
- [13] L. Tong, A. Swami, A. Ephremides, D. Goeckel, A. Scaglione, and S. Servetto, "Future Challenges of Signal Processing and Communications in Wireless Networks," *ACM Mobile Computing and Communications Review*, Vol. 7: pp. 10-16, July 2003.
- [12] G. Ananthaswamy and D. L. Goeckel, "A Fast-Acquiring Blind Predictive DFE," *IEEE Transactions on Communications*, Vol. 50: pp. 1557-1560, October 2002.
- [11] S. Wei and D. L. Goeckel, "Error Statistics for Average Power Measurements in Wireless Communication Systems," *IEEE Transactions on Communications*, Vol. 50: pp. 1535-1546, September 2002.
- [10] D. L. Goeckel and G. Ananthaswamy, "On the Design of Multi-Dimensional Signal Sets for OFDM,"

*IEEE Transactions on Communications*, Vol. 50: pp. 442-452, March 2002.

[9] P. Örmeci, X. Liu, D. L. Goeckel, and R. D. Wesel, "Adaptive Bit-Interleaved Coded Modulation," *IEEE Transactions on Communications*, Vol. 49: pp. 1572-1581, September 2001.

[8] C. Köse and D. L. Goeckel, "On Power Adaptation in Adaptive Signaling Systems," *IEEE Transaction on Communications*, Vol. 48: pp. 1769-1773, November 2000.

[7] D. L. Goeckel and W. E. Stark, "Optimal Diversity Allocation in Multi-User Communication Systems - Part II: Optimization," *IEEE Transactions on Communications*, Vol. 48, pp. 45-52, January 2000.

[6] D. L. Goeckel and W. E. Stark, "Optimal Diversity Allocation in Multi-User Communication Systems - Part I: System Model," *IEEE Transactions on Communications*, Vol. 47, pp. 1828-1836, December 1999.

[5] D. L. Goeckel, "Adaptive Coding for Time-Varying Channels Using Outdated Fading Estimates," *IEEE Transactions on Communications*, Vol. 47, pp. 844-855, June 1999.

[4] D. L. Goeckel, A. O. Hero III, and W. E. Stark, "Data-Recursive Algorithms for Blind Channel Identification," *IEEE Transactions on Signal Processing*, Vol. 46, pp. 2217-2220, August 1998.

[3] D. L. Goeckel and W. E. Stark, "Performance of Coded Direct-Sequence Systems with Rake Reception in a Multipath Fading Environment," *European Transactions on Telecommunications, Special Issue on Spread Spectrum Techniques*, Vol. 6, pp. 41-49, January-February 1995.

[2] D. M. Newman, R. W. Hawley, D. L. Goeckel, R. C. Crawford, S. Abraham, and N. C. Gallagher, "Efficient Storage, Computation, and Exposure of Computer-Generated Holograms by Electron-Beam Lithography," *Applied Optics*, Vol. 32, pp. 2555-2265, May 1993.

[1] D. L. Goeckel, K. J. Webb, and N. C. Gallagher, "Massively Parallel Iterative Determination of Stratified Dielectric Parameters from Scattered-Field Measurements," *Journal of the Optical Society of America, A, Optics and Image Science*, Vol. 10, pp. 1093-1100, May 1993.

### Book Chapters

[4] D. Goeckel, C. Capar, and D. Towsley, "Physical-Layer Secrecy in Large Multi-Hop Wireless Networks," *Physical-Layer Security in Wireless Communications*, Auerbach Press, CRC Press, October 2013.

[3] A. Scaglione, D. Goeckel, and J. Laneman, "Cooperative Communications in Mobile Ad-Hoc Networks: Rethinking the Link Abstraction," to appear in *Distributed Antenna Systems, Open Architectures for Future Wireless Communications*, 2006.

[2] D. L. Goeckel, "Adaptive Coded Modulation for Transmission over Fading Channels" *The CRC Press Signal Processing for Mobile Communications Handbook*, 2003.

[1] D. L. Goeckel, "Bit-Interleaved Coded Modulation," *Wiley Encyclopedia on Telecommunications*, Edited by John Proakis, 2002.

### Conference Publications

[126] T. Sobers, B. Bash, S. Guha, D. Towsley, and D. Goeckel, "Covert Communications on Continuous-Time Channels in the Presence of Jamming," Asilomar Conference on Signals, Systems, and Computers, October 2017.

[125] D. Goeckel, B. Bash, S. Guha, and D. Towsley, "Covert Active Sensing of Linear Systems," Asilomar Conference on Signals, Systems, and Computers, October 2017.

[124] R. Soltani, D. Goeckel, D. Towsley, and A. Houmansadr, "Towards Provably Invisible Network Flow Fingerprints," Asilomar Conference on Signals, Systems, and Computers, October 2017.

[123] K. Li, H. Pishro-Nik, and D. Goeckel, "Bayesian Time Series Matching and Privacy," Asilomar Con-

ference on Signals, Systems, and Computers, October 2017.

[122] N. Takkiri, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Limits of Location Privacy under Anonymization and Obfuscation," IEEE International Symposium on Information Theory (ISIT), June 2017.

[121] N. Takkiri, A. Houmansadr, D. Goeckel, and H. Pishro-Nik, "Fundamental Limits of Location Privacy Using Anonymization," Conference on Information Systems and Sciences (CISS), March 2017.

[120] M. Shifrin, D. Menasche, A. Cohen, O. Gurewitz, and D. Goeckel, "An SMDP Approach to Optimal PHY Configuration in Wireless Networks," Wireless On-demand Network systems and Services Conference, February 2017.

[119] R. Soltani, D. Goeckel, D. Towsley, and A. Houmansadr, "Covert Communications on Renewal Packet Channels," 54th Annual Allerton Conference on Communication, Control, and Computing, September 2016.

[118] A. Sheikholeslami, B. Bash, D. Towley, D. Goeckel, and S. Guha, "Covert Communication over Classical-Quantum Channels," IEEE International Symposium on Information Theory (ISIT), June 2016.

[117] T. Sobers, B. Bash, D. Goeckel, S. Guha, and D. Towsley, "Covert Communication with the Help of an Uninformed Jammer Achieves Positive Rate," *Asilomar Conference on Signals, Systems, and Computers*, November 2015.

[116] R. Soltani, D. Goeckel, D. Towsley, A. Houmansadr, "Covert Communications on Poisson Packet Channels," 53rd Annual Allerton Conference on Communication, Control, and Computing, October 2015.

[115] N. Choungmo-Fofack, M. Dehghan, D. Towsley, M. Badov, and D. Goeckel, "On the Performance of General Cache Networks," International Conference on Performance Evaluation Methodologies and Tools (VALUETOOLS), December 2014.

[114] A. Sheikholeslami, D. Goeckel, and H. Pishro-Nik, "Everlasting Secrecy in Disadvantaged Wireless Environments against Sophisticated Eavesdroppers," *Asilomar Conference on Signals, Systems, and Computers*, November 2014.

[113] K. Morrison and D. Goeckel, "Secrecy Rate Pair Constraints for Secure Throughput," IEEE Military Communication Conference, October 2014.

[112] R. Soltani, B. Bash, D. Goeckel, S. Guha, and D. Towsley, "Artificial Noise Generation to Enhance LPD Throughput on AWGN Channels," Allerton Conference on Communications, Control, and Computing, October 2014.

[111] D. Goeckel, A. Sheikholeslami, and C. Capar, "Everlasting Secrecy in Wireless Communications: Challenges and Approaches," URSI General Assembly and Scientific Symposium, August 2014.

[110] B. Bash, D. Goeckel, and D. Towsley, "LPD Communication when the Warden Does Not Know When," 2014 IEEE International Symposium on Information Theory, June 2014.

[109] A. Sheikholeslami, M. Ghaderi, H. Pishro-Nik, and D. Goeckel, "Jamming-Aware Minimum Energy Routing in Wireless Networks," IEEE International Conference on Communications (ICC), June 2014.

[108] A. Polak and D. Goeckel, "Wireless Device Identification Based on RF Oscillator Imperfections," IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), May 2014.

[107] A. Sheikholeslami, H. Pishro-Nik, M. Ghaderi, and D. Goeckel, "On the Impact of Dynamic Jamming on Network Delay," Conference on Information Sciences and Systems (CISS), March 2014.

[106] M. Deghan, D. Goeckel, T. He, and D. Towsley, "Inferring Military Activity in Hybrid Networks

through Cache Behavior,” 2013 Military Communications Conference, November 2013.

[105] A. Seetharam, B. Jiang, D. Goeckel, J. Kurose, and R. Hancock, “Optimizing Control Overhead for Power-aware Routing in Wireless Networks,” 2013 Military Communications Conference, November 2013.

[104] A. Sheikholeslami, D. Goeckel, and H. Pishro-Nik, “Artificial Intersymbol Interference (ISI) to Exploit Receiver Imperfections for Secrecy,” IEEE International Symposium on Information Theory (ISIT), July 2013.

[103] B. Bash, S. Guha, D. Goeckel, and D. Towsley, “Quantum Noise Limited Optical Communication with Low Probability of Detection,” IEEE International Symposium on Information Theory (ISIT), July 2013.

[102] M. Ghaderi, D. Goeckel, A. Orda, and M. Dehghan, “Efficient Wireless Security Through Jamming, Coding and Routing,” *IEEE Conference on Sensing and Communication in Wireless Networks (SECON)*, June 2013.

[101] A. C. Polak, M. F. Duarte, R. W. Jackson, and D. L. Goeckel, “Recovery of Sparse Signals from Amplitude-Limited Sample Sets,” IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP), Vancouver, Canada, May 2013.

[100] T. He, D. Goeckel, R. Raghavendra, and D. Towsley, “Endhost-Based Shortest Path Routing in Dynamic Networks: An Online Learning Approach,” *IEEE InfoCom*, April 2013.

[99] A. Sheikholeslami, D. Goeckel, and H. Pishro-Nik, “Exploiting the Non-Commutativity of Nonlinear Operators for Information-Theoretic Security in Disadvantaged Wireless Environments,” Allerton Conference on Control, Communications, and Computing, October 2012.

[98] A. Polak, M. Duarte, and D. Goeckel, “Grouped Incoherent Measurements for Compressive Sensing,” 2012 IEEE Statistical Signal Processing Workshop (SSP), August 2012.

[97] B. Bash, D. Goeckel, and D. Towsley, “Square Root Law for Communication with Low Probability of Detection on AWGN Channels,” IEEE International Symposium on Information Theory (ISIT), July 2012.

[96] C. Capar and D. Goeckel, “Network Coding for Facilitating Secrecy in Large Wireless Networks,” *Proceedings of the Conference on Information Sciences and Systems (CISS)*, March 2012.

[95] A. Sheikholeslami, D. Goeckel, H. Pishro-Nik, and D. Towsley, “Physical Layer Security from Inter-Session Interference in Large Wireless Networks,” *IEEE InfoCom*, March 2012.

[94] C. Capar, D. Goeckel, B. Liu, and D. Towsley, “Secret Communication in Large Wireless Networks without Eavesdropper Location Information,” *IEEE InfoCom*, March 2012.

[93] A. Seetharam, J. Kurose, D. Goeckel, and G. Bhanage, “A Markov Chain Model for Coarse Timescale Channel Variation in an 802.16e Wireless Network,” *IEEE InfoCom*, March 2012.

[92] X. Tie, A. Seetharam, A. Venkataramani, D. Ganesan, and D. Goeckel, “Anticipatory Wireless Bitrate Control for Blocks,” *ACM CoNEXT*, December 2011.

[91] K. Morrison and D. Goeckel, “Power Allocation to Noise-Generating Nodes for Cooperative Secrecy in the Wireless Environment,” *Proceedings of the Asilomar Conference on Signals, Systems and Computers*, November 2011.

[90] C. Capar, C. Leow, D. Goeckel, and K. Leung, “A Two-Way Secrecy Scheme for the Scalar Broadcast Channel with Internal Eavesdroppers” *Proceedings of the Asilomar Conference on Signals, Systems and Computers*, November 2011.

- [89] A. Polak and D. Goeckel, "RF Fingerprinting of Users Who Actively Mask Their Identities with Artificial Distortion," *Proceedings of the Asilomar Conference on Signals, Systems and Computers*, November 2011.
- [88] C. Capar, D. Goeckel, B. Liu, and D. Towsley, "Cooperative Jamming to Improve the Connectivity of the 1-D Secrecy Graph," *Proceedings of the Conference on Information Sciences and Systems (CISS)*, March 2011.
- [87] S. Dolatshahi, A. Polak, and D. Goeckel, "Identifying Wireless Users via Power Amplifier Imperfections," *Proceedings of the Asilomar Conference on Signals, Systems, and Computers*, November 2010.
- [86] S. Vasudevan, S. Adams, D. Goeckel, Z. Ding, D. Towsley, K. Leung, "Secrecy in Wireless Networks through Cooperative Chatter," *Proceedings of the Army Science Conference*, November 2010.
- [85] M. Ko and D. Goeckel, "Wireless Physical-Layer Security Performance of UWB systems," *IEEE Mil-Com*, November 2010.
- [84] R. Zhao, D. Goeckel, and J. Mead, "Nonlinear Kalman Filtering for Self-Calibration of Airborne Arrays," 2010 IEEE International Symposium on Phased Array Systems & Technology, October 2010.
- [83] S. Vasudevan, D. Goeckel, and D. Towsley, "Security Versus Capacity Tradeoffs in Large Wireless Networks Using Keyless Secrecy," *ACM MobiHoc*, September 2010.
- [82] M. Dehghan, M. Ghaderi, and D. Goeckel, "Cooperative Diversity Routing in Wireless Networks", *WiOpt 2010*, June 2010.
- [81] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "On the application of cooperative transmission to wireless broadcast channels," *IEEE ICC*, May 2010.
- [80] R. Khalili, D. Goeckel, D. Towsley, and A. Swami, "Neighbor discovery with reception status feedback to transmitters," *IEEE InfoCom*, March 2010.
- [79] M. Dehghan, M. Ghaderi, and D. Goeckel, "On the Performance of Cooperative Routing in Wireless Networks," *IEEE InfoCom (Work in Progress Track)*, March 2010.
- [78] S. Vasudevan, S. Adams, D. Goeckel, Z. Ding, D. Towsley, K. Leung, "Multi-User Diversity for Secrecy in Wireless Networks", *Workshop on Information Theory and Applications*, February 2010.
- [77] Wei Wei, Ting He, Chatschik Bisdikian, Dennis Goeckel, Donald F. Towsley, "Target tracking with packet delays and losses - QoI amid latencies and missing data," *IQ2S 2010: The 2nd IEEE PerCom Workshop on Information Quality and Quality of Service for Pervasive Computing*, February 2010.
- [76] Z. Sheng, D. Goeckel, K. Leung, and Z. Ding, "A Stochastic Geometry Approach to Transmission Capacity in Wireless Cooperative Networks," *IEEE PIMRC*, September 2009.
- [75] S. Vasudevan, D. Towsley, D. Goeckel, and K. Ramin, "Neighbor Discovery in Wireless Networks and the Coupon Collector's Problem," *ACM MobiCom*, September 2009.
- [74] K. Morrison, C. Capar, Z. Lai, D. Goeckel, and R. Jackson, "A Unified Framework for Low-Complexity Ultra-Wideband Signaling," *IEEE International Conference on Ultra-Wideband*, September 2009.
- [73] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "Application of Joint Source-Relay Scheduling to Cooperative Multiple Access Channels," *IEEE International Symposium on Information Theory (ISIT)*, June 2009.
- [72] Z. Ding, K. Leung, D. Goeckel, and D. Towsley, "A New Form of Network Coded Cooperative Transmission for Multiple Access Channels," *IEEE Military Communications Conference*, November 2008.

- [71] H. Joshi, Z. Lai, K. Morrison, C. Capar, and D. Goeckel, "Receiver Optimization in Frequency-Shifted Reference Ultra-Wideband (FSR-UWB) Systems," Asilomar Conference on Signals, Systems, and Computers (invited), October 2008.
- [70] K. Hardwick, D. Goeckel, and D. Towsley, "Antenna Beam Pattern Model for Cooperative Ad-Hoc Networks," Allerton Conference on Control, Communication, and Computing (invited), September 2008.
- [69] Z. Lai, D. Gupta, D. Gupta, H. Joshi, D. Goeckel, and A. Mathew, "Performance of UWB Systems in the Presence of Severe Multipath and Narrowband Interference," IEEE International Conference on Ultra-Wideband (IC-UWB), September 2008.
- [68] L. Wang, B. Liu, D. Goeckel, D. Towsley, and C. Westphal, "Connectivity in Cooperative Wireless Ad Hoc Networks," *ACM MobiHoc*, May 2008.
- [67] H. Liu, A. Molisch, S. Zhao, P. Orlik, and D. Goeckel, "Hybrid Coherent and Frequency-Shifted Reference Ultrawideband Radio," *Proceedings of the Wireless Communications Symposium in association with the IEEE Global Communications Conference*, November 2007.
- [66] D. Goeckel, J. Mehlmann, and J. Burkhart, "A Class of Ultra Wideband (UWB) Systems with Simple Receivers," *Proceeding of the Military Communications Conference*, October 2007.
- [65] Y. Hao, D. Goeckel, Z. Ding, D. Towsley, and K. Leung, "Achievable Rates for Network Coding on the Exchange Channel," *Proceeding of the Military Communications Conference*, October 2007.
- [64] Q. Zhang and D. Goeckel, "Multiple-Access Slightly Frequency-Shifted Reference Ultra-Wideband Communications" *Proceedings of the Communication Theory Symposium in association with the IEEE International Conference on Communications (ICC)*, June 2007.
- [63] J. Liu, D. Goeckel, and D. Towsley, "Bounds on the Gains of Network Coding and Broadcasting in Wireless Networks," *Proceedings of IEEE InfoCom 2007*, May 2007.
- [62] D. Veronesi and D. Goeckel, "Multiple Frequency Offset Compensation in Cooperative Wireless Systems," *Proceedings of the Communication Theory Symposium in association with GlobeCom 2006*, November 2006.
- [61] H. Zhang, G. Ananthaswamy, and D. Goeckel, "Adaptive Modulation in MIMO Eigenbeamforming with Outdated Channel State Information," *Proceedings of the Wireless Communications Symposium in association with GlobeCom 2006*, November 2006.
- [60] H. Xu, L. Yang, and D. Goeckel, "Digital Multi-Carrier Differential Signaling for UWB Radios," *Proceedings of the Wireless Communications Symposium in association with GlobeCom 2006*, November 2006.
- [59] J. Liu, D. Goeckel, and D. Towsley, "The Throughput Order of Ad Hoc Networks Employing Network Coding and Broadcasting," invited for the *Proceedings of the 2006 Military Communications Conference*, October 2006.
- [58] Q. Zhang, D. Goeckel, J. Burkhart, B. Mui, N. Merrill, M. Carrier, and R. Jackson, "FSR-UWB (TR-UWB without the Delay Element): Effect of Impulse Dithering and Experimental Results," *Proceedings of the International Conference on Ultra Wideband*, September 2006.
- [57] S. Song, D. Goeckel, and D. Towsley, "Collaboration Improves the Connectivity of Wireless Networks," *Proceedings of InfoCom 2006*, April 2006.
- [56] S. Vasudevan, C. Zhang, D. Goeckel, and D. Towsley, "Optimal Power Allocation in Wireless Networks with Transmitter-Receiver Power Tradeoffs," *Proceedings of InfoCom 2006*, April 2006.



- [55] Q. Zhang and D. Goeckel, "Multi-Differential Slightly Frequency-Shifted Reference Ultra-wideband (UWB) Radio," *Proceeding of the Conference on Information Sciences and Systems (CISS)*, March 2006.
- [54] L. Atieno, J. Allen, R. Tessier, and D. Goeckel, "An Adaptive Reed Solomon Errors-and-Erasures Decoder," *Proceedings of the ACM SIGDA International Symposium on Field Programmable Gate Arrays*, Monterey, CA, February 2006.
- [53] D. Goeckel and Q. Zhang, "Slightly Frequency-Shifted Reference Ultra-Wideband (UWB) Radio: TR-UWB without the Delay Element," *Proceedings of the 2005 Military Communications Conference*, October 2005.
- [52] Y. Hao, D. Goeckel, R. Janaswamy, and S. Frasier, "Surface Refractive Index Field Estimation from Multiple Radars," *Proceedings of the 2005 IEEE AP-S International Symposium on Antennas and Propagation*, July 2005.
- [51] S. Vasudevan, D. Goeckel, and D. Towsley, "Optimal Power Allocation in Channel-Coded Wireless Networks," *Proceedings of the Allerton Conference on Communication, Control, and Computing*, October 2004.
- [50] D. Goeckel and Y. Hao, "Space-Time Coding for Distributed Antenna Arrays," *Proceedings of the Communication Theory Symposium in association with the IEEE International Conference on Communications*, June 2004.
- [49] J. Liang, R. Tessier, and D. Goeckel, "A Dynamically-Reconfigurable, Power-Efficient Turbo Decoder," *Proceedings of the IEEE Symposium on Field-Programmable Custom Computing Machines (FCCM)*, April 2004.
- [48] S. Wei, D. Goeckel, and M. Valenti, "Asynchronous Cooperative Diversity," *Proceedings of the Conference on Information Sciences and Systems (CISS)*, March 2004.
- [47] H. Zhang and D. Goeckel, "Generalized Transmitted-Reference UWB Systems," *Proceedings of the Conference on Ultra-Wideband Systems and Technologies (UWBST)*, November 2003.
- [46] A. Klein, D.R. Brown, D. Goeckel, and C.R. Johnson, "rake Reception for UWB Communication Systems with Intersymbol Interference," *Proceedings of the Signal Processing Advances in Wireless Communications (SPAWC) Conference*, June 2003.
- [45] S. Wei, D. Goeckel, and R. Janaswamy, "On the Asymptotic Capacity of MIMO Systems with Fixed Length Linear Antenna Arrays," *Proceedings of the Communication Theory Symposium of the IEEE International Conference on Communications*, May 2003.
- [44] D. Goeckel and Y. Hao, "Macroscopic Space-Time Coding: Motivation, Performance Criteria, and a Class of Orthogonal Designs," *Proceedings of the Conference on Information Sciences and Systems*, March 2003.
- [43] B. Liu, D. Goeckel, and D. Towsley, "TCP-Cognizant Adaptive Forward Error Correction in Wireless Networks," *Proceedings of the Global Telecommunications Conference*, November 2002.
- [42] H. Zhang, S. Wei, D. Goeckel, and M. Win, "Hybrid Acquisition of Ultra-Wideband Communication Signals," (invited) *Proceedings of the 36th Asilomar Conference on Signals, Systems, and Computers*, November 2002.
- [41] S. Wei, D. Goeckel, and P. Kelly, "On Calculating the Distribution of the Peak-to-Average Power Ratio in OFDM Systems," *Proceedings of the 2002 IEEE International Conference on Telecommunications*, June 2002.

- [40] S. Wei, D. Goeckel, and P. Kelly, "A Modern Extreme Value Theory Approach to Calculating the Distribution of the Peak-to-Average Power Ratio in OFDM Systems," *Proceedings of the IEEE International Conference on Communications*, May 2002.
- [39] S. Wei, D. Goeckel, and R. Janaswamy, "On the Capacity of Fixed Length Linear Antenna Arrays Under Bandlimited Correlated Fading," *Proceedings of the 2002 Conference on Information Sciences and Systems*, March 2002.
- [38] K. Kamath and D. Goeckel, "Outage in Adaptive Wireless Communication Systems," (invited) *Proceedings of the 35th Asilomar Conference on Signals, Systems, and Computers*, pp. 1031-1035, November 2001.
- [37] K. Kamath and D. Goeckel, "Adaptive Modulation Schemes for Minimum Outage Probability in Wireless Systems," *Proceedings of the Global Telecommunications Conference*, pp. 1267-1271, November 2001.
- [36] S. Wei, D. Goeckel, and P. Kelly, "The OFDM Signal Envelope Converges Weakly to a Gaussian Random Process: Proof and Application," full paper (10 pages) in the *Proceedings of the 39<sup>th</sup> Annual Allerton Conference*, October 2001.
- [35] W. Bursleson, R. Tessier, D. Goeckel, S. Swaminathan, P. Jain, J. Euh, S. Venkatraman, V. Thyagarajan, "Dynamically Parameterized Algorithms and Architectures to Exploit Signal Variations for Improved Performance and Reduced Power," *Proceedings of the 2001 Conference on Acoustics, Speech, and Signal Processing*, pp. 901-904, May 2001.
- [34] S. Wei and D. L. Goeckel, "Power Control Based on Measurements with Statistical Uncertainty," *Proceedings of the 2001 Conference on Modeling and Design of Wireless Networks*, August 2001.
- [33] C. Köse, D. L. Goeckel, and S. Wei, "Minimum Complexity Sequential Multihypothesis Detection," *Proceedings of the 2001 International Symposium on Information Theory*, pp. 18, June 2001.
- [32] S. Wei and D. L. Goeckel, "Error Statistics for Average Power Measurements in Wireless Communication Systems," *Proceedings of the 2001 International Communications Conference*, pp. 1073-1077, June 2001.
- [31] G. Ananthaswamy and D. L. Goeckel, "A Fast-Converging Blind Predictive DFE," *Proceedings of the 2001 International Communications Conference*, pp. 1068-1072, June 2001.
- [30] X. Liu, P. Örmeci, R. D. Wesel, and D. L. Goeckel, "Bandwidth-Efficient, Low-Latency Adaptive Coded Modulation Schemes for Time-Varying Channels," *Proceedings of the 2001 International Communications Conference*, pp. 2211-2215, June 2001.
- [29] G. Ananthaswamy and D. L. Goeckel, "A Novel Hybrid Single-Carrier/Multicarrier Scheme for Highly Bandwidth Efficient Wireless Communication," *Proceedings of the 38<sup>th</sup> Annual Allerton Conference*, pp. 377-386, October 2000.
- [28] C. Köse and D. L. Goeckel, "Minimum Complexity Sequential Multihypothesis Detection: Weak Sequential Tests," (invited) *Proceedings of the 2000 IEEE Wireless Communications and Networking Conference*, pp. 129-133, September 2000.
- [27] D. L. Goeckel, W. E. Ryan, and P. Örmeci, "On Iterative Adaptive Signaling for Wideband Wireless Channels," (invited) *Proceedings of the SPIE AeroSense 2000 Conference*, April 2000.
- [26] C. Köse and D. L. Goeckel, "Sequential Multihypothesis Testing with Minimum Computational Effort," *Proceedings of the 2000 Conference on Information Sciences and Systems*, pg. TA1-26, January 2000.
- [25] S. Wei and D. L. Goeckel, "Adaptive Signaling Based on Measurements with Statistical Uncertainty,"

(invited) *Proceedings of the 33rd Asilomar Conference on Signals, Systems, and Computers*, pp. 27-31, October 1999.

[24] D. L. Goeckel, M. Chu, and W. E. Stark, "Improved Markov Models for Fading Channels: Analysis and Design," *Proceedings of the 37<sup>th</sup> Annual Allerton Conference on Communication, Control, and Computing*, pp. 525-534, September 1999 (also appeared in slightly modified form as: M. Chu, D. L. Goeckel, and W. E. Stark, "Markov Models for Fading Channels," *Proceedings of the 1999 Vehicular Technology Conference*, pp. 2372-2376, September 1999).

[23] D. L. Goeckel and G. Ananthaswamy, "Increasing Diversity with Non-Standard Signal Sets in Wireless OFDM Systems" (invited) *Proceedings of the 1999 IEEE Wireless Communications and Networking Conference*, pg. 20-24, September 1999.

[22] D. L. Goeckel, "Coded Modulation with Non-Standard Signal Sets for Wireless OFDM Systems," *Proceedings of the 1999 International Conference on Communications*, pp. 791-795, May 1999.

[21] C. Köse and D. L. Goeckel, "On Power Adaptation in Adaptive Signaling Systems," *Proceedings of the 1999 Conference on Information Sciences and Systems*, pp. 103-108, March 1999 (also presented at the IEEE Signal Processing and Applications Conference - IEEE Sinyal Isleme Ve Uygulamalari Kurultayi (SIU'99), May 1999).

[20] P. Örmeci, D. L. Goeckel, and R. D. Wesel, "Adaptive Bit-Interleaved Coded Modulation for Time-Varying Channels Using Outdated Fading Estimates," *Proceedings of the 1999 Conference on Information Sciences and Systems*, pp. 63-68, March 1999 (also at the IEEE Signal Processing and Applications Conference - IEEE Sinyal Isleme Ve Uygulamalari Kurultayi (SIU'99), May 1999).

[19] D. L. Goeckel, "Coded Modulation for Peak Power Constrained OFDM Systems," *Proceedings of the 1998 Allerton Conference on Communication, Control, and Computing*, pp. 126-135, September 1998.

[18] D. L. Goeckel, "Strongly Robust Adaptive Signaling for Time-Varying Channels," *Proceeding of the 1998 International Conference on Communications*, pp. 454-458, June 1998.

[17] D. L. Goeckel, "Adaptive Coding for Fading Channels using Outdated Fading Estimates," *Proceedings of the 1998 IEEE 48<sup>th</sup> Vehicular Technology Conference*, pp. 1925-1929, May 1998.

[16] G. Ananthaswamy and D. L. Goeckel, "Decoding for Interleaved Coded DPSK Systems Operating over Fading Channels," *Proceedings of the 3<sup>rd</sup> Annual R & D Conference of the Massachusetts Telecommunications Council*, November 1997.

[15] D. L. Goeckel, A. Ganz, and D. M. Pozar, "A High-Speed WLAN Architecture Based on Adaptive OFDM," *Proceedings of the 3<sup>rd</sup> Annual R & D Conference of the Massachusetts Telecommunications Council*, November 1997.

[14] D. L. Goeckel, "Robust Adaptive Coding for Time-Varying Fading Channels with Delayed Feedback," *Proceedings of the 1997 Allerton Conference on Communication, Control, and Computing*, pp. 370-379, October 1997.

[13] D. L. Goeckel, "Optimal Power Adaptation in Digital Repeaters," *Proceedings of the 1997 Allerton Conference on Communication, Control, and Computing*, pp. 383-384, October 1997.

[12] D. L. Goeckel and W. E. Stark, "Optimal Diversity Allocation for Multi-User Systems Operating over Jammed Multipath Fading Channels," *Conference Record of the 1997 Military Communications Conference*, November 1997.

[11] D. L. Goeckel and W. E. Stark, "A Coded Multicarrier Framework for the Optimization of Multi-User Communication Systems over Fading Channels," *Proceedings of the 47<sup>th</sup> Vehicular Technology Conference*,

pp. 2075-2079, May 1997.

[10] D. L. Goeckel and W. E. Stark, "Throughput Optimization in Multiple-Access Systems with Decorrelator Reception," *Proceedings of the Conference on Information Theory and its Applications*, pp. 653-656, 1996.

[9] D. L. Goeckel and W. E. Stark, "Optimizing Diversity Allocation in Coherent Multi-User Systems," *Proceedings of the Tactical Communications Conference*, 1996.

[8] D. L. Goeckel, A. O. Hero III, and W.E. Stark, "Blind Channel Identification for Direct-Sequence Systems," *Conference Record of the 1995 IEEE Military Communications Conference*, pp. 368-372, November 1995.

[7] D. L. Goeckel and W. E. Stark, "Throughput Optimization in Faded Multicarrier Systems," *Proceedings of the Allerton Conference on Communications, Control, and Computing*, pp. 815-824, October 1995.

[6] D. L. Goeckel and W.E. Stark, "Limits of Coding and Modulation in Spread-Spectrum Systems," *Proceedings of the 1995 IEEE IT Workshop on Information Theory, Multiple Access, and Queueing*, pg. 50, April 1995.

[5] D. L. Goeckel and W.E. Stark, "Performance of Coded Direct-Sequence Systems in Fading Channels with Rake Reception," *Conference Record of the 1994 IEEE Military Communications Conference*, Vol. 3, pp. 791-795, October 1994.

[4] D. L. Goeckel and W.E. Stark, "Performance of a Direct-Sequence Spread-Spectrum System with Rake Reception in a Multipath Fading Environment," *Proceedings of the Third IEEE International Symposium on Spread-Spectrum Techniques and Applications*, pp. 465-469, July 1994.

[3] D. L. Goeckel, K. J. Webb, and N. C. Gallagher, "Inverse Scattering Computations for Stratified Media Problems Using Massively Parallel Computers," *Digest of the 1993 IEEE Antennas and Propagation International Symposium*, pp. 524-527, June 1993.

[2] D. L. Goeckel, K. J. Webb, N. C. Gallagher, T. A. Gosink, and John J. Kelley, "Microwave and Optical Measurements and Parallel Computation for the Determination of Sea Ice Characteristics," *Proceedings of the Eight International Symposium on Okhotsk Sea & Sea Ice and ISY / Polar Ice Extent Workshop*, pp. 533-537, February 1993.

[1] D. M. Newman, D. L. Goeckel, R. C. Crawford, and S. Abraham, "Parallel Holographic Image Calculation and Compression," *Proceedings of the Fourth Symposium on the Frontiers of Massively Parallel Computers*, 1992.