

## EDUCATION

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- Doctor of Philosophy, Electrical Engineering** Drexel University, Philadelphia, PA  
• Thesis: *Throughput Characterizations of Wireless Networks via Stochastic Geometry and Random Graph Theory* June 2015
- Master of Science, Electrical Engineering** Drexel University, Philadelphia, PA  
• Thesis: *Topics on Modeling and Simulation of Wireless Networking Protocols* June 2009
- Bachelor of Science, Electrical Engineering** Drexel University, Philadelphia, PA  
• Summa Cum Laude, Mathematics Minor June 2009

## INDUSTRY EXPERIENCE

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- MIT Lincoln Laboratory** - Tactical Networks Group Lexington, MA  
*Technical Staff* Mar. 2016 - current  
• Member of group responsible for developing architectures, technologies, algorithms, and protocols to enable the next generation of military airborne, ground, and maritime mobile networks.
- Cisco Systems, Inc.** - Network Operating Systems Technology Group (NOSTG) Boxborough, MA  
*Software Engineer III Intern* June-Sept., 2012  
• Member of Software Defined Networking Agent (SDNA) team responsible for OpenFlow deployment in IOS, IOS-XR, and NX-OS network operating systems  
• Extended Open vSwitch (OVS) for proof-of-concept OpenFlow compatibility on Nexus 7000 series switches  
– Wrote OVS network device class to manage line card interfaces and integrate with NX-OS networking stack to capture packets and apply flow forwarding rules  
– Communicated with technical leads, engineers, and management to resolve issues with software version control, build, & deployment tools, networking stack APIs, and server room equipment reservation/use  
• Created and maintained a virtual network testbed on a Cisco Unified Computing System (UCS) server using VMware ESXi hypervisor to support colleagues' SDNA development on IOS-XR
- MIT Lincoln Laboratory** - Wideband Tactical Networking Group Lexington, MA  
*Summer Intern* June-Sept., 2007 & 2009  
• Enabled verification and validation of tactical radio network protocol specifications via OPNET simulation  
– Designed physical layer model from technical documentation and catalogued bugs in specifications  
– Delivered physical models ahead of schedule and contributed to IP-layer modeling with leftover time  
– Extended MATLAB bit-error-rate simulation framework to use modulation and coding techniques  
• Provided simulation validation of an emulation testbed for analyzing wireless networking protocols  
– Researched OSPF routing protocol to create an OPNET simulation matched to the emulated environment  
– Demonstrated value of cross-validating simulation results with emulation testbed by revealing and addressing protocol overhead discrepancies across OSPF implementations

## SKILLS &amp; ASSETS

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*Operating Systems:* Linux (Debian/Ubuntu), MS Windows, Mac OS X  
*Software:* MATLAB, Mathematica, OPNET, Git, SVN, GNU Autotools, VMware ESXi, MS Office, Databases (MySQL & MongoDB)  
*Programming & Scripting:* C/C++, Python, JavaScript, HTML/CSS, L<sup>A</sup>T<sub>E</sub>X, Bash, Ruby

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HONORS & MEMBERSHIPS

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- Drexel U. Presidential (full-tuition) Scholarship, 2003-2008
- Milton Rosenberg Scholarship, 2006
- Harry E. Muchnic Fdn. Scholarship, 2006 & 2007
- Frank and Agnes Seaman Endowed Fellowship, 2014
- Eta Kappa Nu (HKN) - Electrical and Computer Engineering Honors Society
- Institute of Electrical and Electronics Engineers (IEEE), *Member*, 2004-Present

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RESEARCH EXPERIENCE

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**Wireless Communications**

Drexel University

*Research Assistant*

July 2014 - Oct. 2015

- Apply optimization techniques and analysis to cellular user association for network utility maximization
- Propose novel combination of binary hypothesis testing with stochastic geometry to characterize the accuracy of the protocol interference model in wireless networks
- Express the sensitivity of greedy scheduling throughput-(sub)optimality to communication edge density in large wireless networks using random graph theory

**Reconfigurable Antennas & Dynamic Spectrum Access Algorithms**

Drexel U./U. Oulu

*Research Assistant/Visiting Scholar*

Jan.-Dec., 2013

- *Sponsor*: NSF Program for Wireless Innovation between Finland and US (Award #1147838)
- Traveled to Finland for July 2013 research visit at the Center for Wireless Communications, U. Oulu
- Led collaborative research on the impact of beamsteering error in directional wireless networks

**A Meso-Scale GENI WiMAX Project**

Drexel University

*Research Assistant*

Mar. 2011 - May 2012

- *Sponsor*: National Science Foundation (NSF) Program for Special Projects (Award #1138949)
- Assisted in writing proposal to deploy experimental wireless testbed in downtown Philadelphia
- Developed cellular site plan with Drexel IT and Facilities for two WiMAX basestation sectors
- Conducted measurement campaign to identify open spectrum and filed for FCC license (Call Sign: WG2XBX)

**Applied Communications and Information Networking (ACIN) Program**

Drexel University

*Research Assistant*

July 2004 - June 2014

- *Sponsor*: U.S. Army Communications Electronics Research Development and Engineering Center (CERDEC)
- Engaged in many facets of multi-year, multi-scope projects to perform modeling and simulation in support of defense-related communications research problems
- *Phases 6-12*: Modeling & Simulation of Communications, Cognitive Networking, and Directional Antennas
  - Analyzed and documented performance of power control, scheduling, routing, and directional antennas
  - Led and completed rapid-prototype of a Linux-based wireless routing algorithm
  - Contributed graph, networking, and optimization algorithms to C/C++ library for network design
  - Streamlined library development, installation, and use via GNU Autotools and Debian packaging tools
  - Refined coding practices that resulted in cleaner code structure and 50% reduction in compile time
- *Phases 6,9*: Seamless Network Integration using IPv6; IPv6 Compression Techniques and Performance
  - Constructed TinyOS sensor testbed to capture and dissect header-compressed frames via Wireshark
  - Conducted survey and simulation of IPv6 stateless address autoconfiguration algorithms in OPNET simulator to identify suitability for tactical deployment
- *Phases 4-7*: Modeling & Simulation in Support of COMPOSER/CJSMP
  - Characterized effects of cross-modulation interference using bit-level simulations in MATLAB
  - Developed abstractions for fast, accurate discrete event simulation of IEEE 802.11 networks
  - Delivered prototype wireless networking protocol stack in Lockheed Martin CSIM network simulator

PUBLICATIONS

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**Journals**

- [J1] J. **Wildman** and S. Weber, "On characterizing the local pooling factor of greedy maximal scheduling in random graphs," *IEEE/ACM Trans. Netw.*, vol. 24, no. 4, 2016.
- [J2] J. **Wildman**, P. H. J. Nardelli, M. Latva-aho, and S. Weber, "On the joint impact of beamwidth and orientation error on throughput in directional wireless Poisson networks," *IEEE Trans. Wireless Commun.*, vol. 13, no. 12, 2014.

**Conferences**

- [C1] J. **Wildman**, Y. Osmanlioglu, S. Weber, and A. Shokoufandeh, "A primal-dual approach to delay minimizing user association in cellular networks," in *Proc. 52nd Annu. Allerton Conf. Commun., Control, and Computing (Allerton)*, 2015.
- [C2] —, "Delay minimizing user association in cellular networks via hierarchically well-separated trees," in *Proc. IEEE Int. Conf. Commun. (ICC)*, 2015.
- [C3] J. **Wildman** and S. Weber, "Minimizing the Bayes risk of the protocol interference model in wireless Poisson networks," in *Simons Conf. on Networks and Stochastic Geometry [Poster Track]*, 2015.
- [C4] —, "On the incompatibility of connectivity and local pooling in Erdős-Rényi graphs," in *Proc. 51st Annu. Allerton Conf. Commun., Control, and Computing (Allerton)*, 2013.
- [C5] A. Fridman, J. **Wildman**, and S. Weber, "Observations on sum user rate for cellular downlink," in *Proc. 8th Int. Conf. on Cognitive Radio Oriented Wireless Networks (CROWNCOM)*, 2013.
- [C6] A. Elanchezian, J. **Wildman**, J. de Oliveira, and S. Weber, "System for controlled testing of sensor networks: Architecture, prototype, and experimental evaluation," in *Proc. 44th Annu. IEEE Conf. Inform. Sci. and Syst. (CISS)*, 2010.
- [C7] C. Chrysanthou, J. Boksiner, M. Zankel, G. Minko, D. S. Pfeil, J. Kountouriotis, J. **Wildman**, M. Garfield, T. P. Kurzweg, K. R. Dandekar, and M. Kam, "Simulation of waveform interactions for interference analysis of military networks," in *Proc. 28th Annu. IEEE Military Commun. Conf. (MILCOM)*, 2009.
- [C8] G. Carl, S. Dastango, and J. **Wildman**, "Using an emulation testbed to measure OSPF routing overhead due to mobility in wireless ad hoc networks," in *Proc. 27th Annu. IEEE Military Commun. Conf. (MILCOM)*, 2008.
- [C9] J. **Wildman**, D. Hamel, R. Measel, D. Oakum, S. Weber, and M. Kam, "Performance and scaling of wireless ad hoc IPv6 stateless address autoconfiguration under mobile gateways," in *Proc. 26th Annu. IEEE Military Commun. Conf. (MILCOM)*, 2007.
- [C10] J. **Wildman**, B. Willman, M. Kirkpatrick, and S. Weber, "RTS/CTS data link abstractions for mobile ad hoc networks," in *Proc. 25th Annu. IEEE Military Commun. Conf. (MILCOM)*, 2006.