Benjamin (Ben) W. Priest

CONTACT INFORMATION

Graduate Student
Thayer School of Engineering
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PROFESSIONAL INTERESTS

Space-efficient analysis of large, evolving datasets, especially graphs: streaming algorithms, sketching, machine learning, network analysis, numerical linear algebra, compressed sensing, high performance computing, optimization, and natural language processing

RESEARCH EXPERIENCE

MIT Lincoln Laboratory, Lexington, MA, USA
Cyber Analytics and Decision Systems Group, Supervisor: Dr. Kevin M. Carter

Assistant Research Scientist **August 2011 to July 2015**

- Developed novel machine learning algorithms to educe human and machine behavior from computer network protocol traffic
- Implemented cognitive multi-agent systems to perform high-fidelity network traffic generation for cyber range experiments
- Evaluated the network-level efficacy of "moving target" computer network defenses against modeled adversaries using a multi-agent simulation platform of my design
- Communicated research to professional audiences at conferences and seminars

Air Force Institute of Technology, Wright-Patterson Air Force Base, OH, USA
Program Encryption Group, Supervisor: Professor J. Todd McDonald

Engineering Technician GS-05 **June to September, 2008 & 2009**

- Developed obfuscation metrics for combinatorial circuits using abstract interpretation-based software semantic models

TECHNICAL SKILLS

Big Data Ecosystems: Hadoop, MapReduce, HDFS and Elemental

Programming Languages: C/C++, Java

Scripting Languages: Python, XML and Bash

Numerical Analysis: MATLAB, Mathematica and R

Version Control: Git and VCS (CVS, SVN)

Editors: Emacs, Eclipse, IntelliJ and Vim

Typesetting: TEX (LATEX, BIBTEX)

EDUCATION

Dartmouth College, Hanover, NH, USA 2015-Present

Ph.D., Engineering, Ongoing

- Adviser: Professor George Cybenko
- Thesis: Sublinear Approximations of Vertex Centrality in Evolving Graphs

The Ohio State University, Columbus, OH, USA 2007-2011

B.S., Mathematics, *Cum Laude*, June 2011

B.S., Computer and Information Science, *Cum Laude*, June 2011

Teaching Experience

Thayer School of Engineering at **Dartmouth College**, Columbus, OH

Teaching Assistant

- Instructor for ENGS/QBS 108: Applied Machine Learning **Autumn 2017**
  - Collaborated with instructors to develop course curriculum aimed at graduate engineering and computer science students
  - Designed and taught approximately twenty-five percent of the course lecture content, including all practical implementation content
  - Provided ground and one-on-one assistance to students covering lecture topics
  - Planned, wrote, and graded student assignments
- Instructor for ENGS 177: Decision Making Under Risk and Uncertainty **Winter 2017**
  - Planned and taught a weekly recitation covering practical machine learning topics
  - Provided ground and one-on-one assistance to students covering lecture topics
  - Graded student assignments

The Ohio State University, Columbus, OH

Teaching Assistant

- Instructor for CSE 625: Automata and Formal Languages **Summer & Autumn 2010**
  - Planned and taught a weekly recitation covering details and proofs of lecture topics
  - Graded student assignments
- Grader for CSE 560: System Software Design and Devlopment **Summer 2010**
  - Graded student assignments

Peer-Reviewed Conference Publications

[1] Luan Hoy Pham, Massimiliano Albanese, and Benjamin W. Priest. Quantifying APT Malware. [In Preparation]. March, 2018.

[2] Luan Hoy Pham, Massimiliano Albanese, and Benjamin W. Priest. Dynamic Defense Placement Against Advanced Persistent Threats. [In Preparation]. March, 2018.

[3] Benjamin Priest, Era Vuksani, Neal Wagner, Brady Tello, Kevin M. Carter, and William W. Streilein. Agent-based simulation in support of moving target cyber defense technology development and evaluation. In *Proceedings of the 2015 ACM Spring Simulation Multi-Conference - Communications and Networking Simulation Symposium*, SpringSim '15, 2015

[4] Benjamin Priest and Kevin M. Carter. Characterizing latent user interests on enterprise networks. In *Proceedings of the Twenty-Seventh International Florida Artificial Intelligence Research Society Conference, FLAIRS 2014, Pensacola Beach, Florida, May 21-23, 2014.*, 2014

[5] Kevin M. Carter, Rajmonda S. Caceres, and Ben Priest. Latent community discovery through enterprise user search query modeling. In *Proceedings of the 37th International ACM SIGIR Conference on Research & Development in Information Retrieval*, SIGIR '14, pages 871–874, 2014. ISBN 978-1-4503-2257-7

[6] Kevin Gold, Zachary J. Weber, Ben Priest, Josh Ziegler, Karen Sittig, William W. Streilein, and Mark Mazumder. Modeling how thinking about the past and future impacts network traffic with the GOSMR architecture. In *International conference on Autonomous Agents and Multi-Agent Systems, AAMAS '13, Saint Paul, MN, USA, May 6-10, 2013*, pages 127–134, 2013b

[7] Kevin Gold, Ben Priest, and Kevin M. Carter. An expectation maximization approach to detecting compromised remote access accounts. In *Proceedings of the Twenty-Sixth International Florida Artificial Intelligence Research Society Conference, FLAIRS 2013, St. Pete Beach, Florida. May 22-24, 2013.*, 2013a

Other Conference Publications

[8] Benjamin W. Priest and George Cybenko. Approximating centrality in evolving graphs: toward sublinearity. In *Proceedings of the 2017 SPIE Defense and Security Conference*, SPIE '17. SPIE, 2017

[9] Benjamin W. Priest and George Cybenko. Efficient inference of hidden Markov models from large observation sequences. In *Proceedings of the 2016 SPIE Defense and Security Conference*, SPIE '16. SPIE, 2016

[10] Kevin M. Carter, Ramona S. Caceres and Benjamin W. Priest Characterization of latent social networks discovered through computer network logs. In *Networks in the Social and Information Sciences workshop of the 29th Annual Conference on Neural Information Processing Systems (NIPS 2015)*, Montreal, Canada, December, 2015.

[11] Ben Priest and Kevin Gold. Utility discounting explains informational website traffic patterns before a hurricane. In *22nd International World Wide Web Conference, WWW '13, Rio de Janeiro, Brazil, May 13-17, 2013, Companion Volume*, pages 53–54, 2013

Awards

MIT Lincoln Laboratory

- Lincoln Scholar Program recipient, 2015 (declined)

The Ohio State University

- Phi Beta Kappa Inductee, 2010
- Mathematics Kenneth Cummings Scholarship, 2008–2011
- Distinguished Merit Scholarship, 2007–2011
- Ohio Academic Scholarhship, 2007-2011
- Bingham Award in Philosophy, 2010