Benjamin (Ben) W. Priest

CONTACT INFORMATION

Graduate Student
Thayer School of Engineering
Dartmouth College

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PROFESSIONAL INTERESTS

Efficient analysis of large, dynamic datasets: streaming algorithms, sketching, machine learning, graph algorithms, numerical linear algebra, compressed sensing, high performance computing, graph theory, optimization, network analysis, and natural language processing

EDUCATION

Thayer School of Engineering at **Dartmouth College**, Hanover, VT, USA

Ph.D., Engineering (GPA 4.0) **09/2015 – 12/2018 (Projected)**

- Advisor: Professor George Cybenko
- Thesis: Sublinear Approximations of Vertex Centrality in Evolving Graphs
- Demonstrated novel, sublinear-space sketching algorithms to efficiently estimate local triangle counts and vertex centrality on large, distributed graphs

The Ohio State University, Columbus, OH, USA

B.S., Mathematics, (GPA 3.62 *Cum Laude*) **09/2011 – 06/2011**

B.S., Computer and Information Science, (GPA 3.62 *Cum Laude*) **09/2011 – 06/2011**

PROFESSIONAL EXPERIENCE

Dartmouth College, Hanover, NH, USA
Thayer School of Engineering. Advisor: Professor George Cybenko

Research and Teaching Assistant **09/2015 – 12/2018 (Projected)**

- Developed novel sublinear-space sketching algorithms to estimate popular centrality indices in large distributed graphs
- Taught courses in applied machine learning, with an emphasis on deep learning while leading a team of TAs

Lawrence Livermore National Laboratory, Livermore, CA, USA
Center for Applied Scientific Computing. Supervisor: Dr. Roger Pearce

Computation Student Intern **05/2018 – 12/2018 (Projected)**

- Developed and implemented sophisticated communication protocols in a big-data environment in collaboration with the HAVOQGT project
- Improved performance of distributed algorithms with irregular computational load

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

Assistant Research Scientist **08/2011 – 07/2015**

- Designed and implemented 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 network-scale simulation experiments

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

Engineering Technician GS-05 **Summer, 2008 & 2009**

- Developed encryption metrics for circuits using abstract-interpretation semantic models

AWARDS

SECRYPT
Best Paper Award, 2018

MIT Lincoln Laboratory
Lincoln Scholar Program recipient, 2015
- (declined)

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

Technical Expertise

Mathematics
- Applied Mathematics
- Real Analysis and Measure Theory
- Graph Theory
- Combinatorics

Computer Science and Engineering
- Distributed & parallel algorithms
- Streaming algorithms & sketching
- Data structures

Data Science and Processing
- Probability & Random Variables
- Statistics & Estimation
- Machine learning & deep learning
- Numerical Optimization
- Stochastic Processes
- Information Theory
- Communication Theory

Programming Languages
- C/C++, Java, MATLAB, R

Scripting Languages
- Python, Bash, Julia

Distributed Computing
- MPI, Hadoop MapReduce, Lustre

Software
- Keras, TensorFlow, Mathematica
- Git, GitHub/Bitbucket
- LaTeX, BibTeX

Operating Systems
- Apple OS X
- Linux, RedHat, and other UNIX variants

Interpersonal
- Teamwork and communication
- Leadership and mentoring
- Public and technical speaking

Selected Publications

[1] **Benjamin W. Priest**, Roger Pearce, and Geoffrey Sanders. DegreeSketch: Distributed cardinality sketches on graphs, with applications to counting triangles. In *Proceedings of the 2018 World Wide Web Conference*, WWW. 2019. [In Preparation]

[2] **Benjamin W. Priest**, Roger Pearce, and Geoffrey Sanders. You've Got Mail: Boosting performance of irregular distributed workloads using asynchronous collectives. [In Preparation]

[3] **Benjamin W. Priest**, Roger Pearce, and Geoffrey Sanders. Estimating edge-local triangle count heavy hitters in edge-linear time and almost-vertex-linear space In *Proceedings of the IEEE High Performance Extreme Computing Conference*, HPEC. 2018.

[4] Luan Hoy Pham, Massimiliano Albanese, and **Benjamin W. Priest**. A quantitative framework to model advanced persistent threats. In *Proceedings of the 15th International Conference on Security and Cryptography*, SECRYPT. 2018.

[5] **Ben W. 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 18th Symposium on Communications & Networking, 2015 ACM Spring Simulation Multi-Conference*, CNS/SpringSim. 2015.

[6] **Ben 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.

[7] 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. 2014.

[8] 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. 2013.

[9] **Ben Priest** and Kevin Gold. Utility discounting explains informational website traffic patterns before a hurricane. In *Proceedings of the 22nd International World Wide Web Conference*, WWW. 2013.

[10] 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.