

Benjamin Berg
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Research Interests

Parallel Scheduling, Caching, Queueing Theory, Performance Modeling of Computer Systems

Education

Carnegie Mellon University, School of Computer Science

August 2016-Present

Third year Ph.D. student, Computer Science Department

Advised by Mor Harchol-Balter

Duke University, Trinity School of Arts & Sciences

Graduated May 2013

Magna Cum Laude, major in Computer Science, minors in Economics and Math

Cumulative GPA: 3.87

Thesis resulting in graduation with High Distinction in Computer Science

Received Alex Vasilos Memorial Award in Computer Science for outstanding research, coursework, and contributions as a teaching assistant

Phi Beta Kappa

Work Experience

Research Assistant, Computer Science Department, Carnegie Mellon University

August 2015-Present

Working with Ph.D. advisor Mor Harchol-Balter on applications of queuing theoretic models to the analysis of computer systems. Served as teaching assistant for *Performance Modeling of Computer Systems* graduate course. Current research projects include:

- Optimal scheduling of parallelizable jobs in multicore systems to minimize average latency
- Server-side caching for web services to minimize tail latency of web requests

Developer and Researcher, Production Kernel Team, Google

Summer 2018

Worked on linux scheduler for the production kernel used on Google Cloud VM hosting servers.

Developer and Researcher, Life Long Kindergarten Group, MIT Media Lab

August 2015 – August 2016

Developed new features for the Scratch programming language. Performed research based on usage data from the Scratch online community. Worked with researchers at the MIT Media Lab and University of Washington to model trends in collaboration in the Scratch online community. Described the influences of website design changes on patterns of user collaboration.

Technology Associate, Statistical Arbitrage, Susquehanna International Group

August 2013 – August 2015

Worked on the statistical arbitrage desk, which specializes in low latency trading of securities. Worked on the core of the low latency trading platform, as well as scalable monitoring, alerting, and process scheduling tools. Worked with SIG assistant traders to complete quantitative analysis of trading opportunities related to long dated options on U.S. equities.

Technology Summer Analyst, Barclays Capital

Summer 2012

Performed analysis of middle office equities trading systems.

Teaching Assistant, Duke University Computer Science

2011-2013

Introduction to Computer Science, Spring 2011 and Fall 2011 (Professors Owen Astrachan, Robert Duvall)

Software Design and Implementation, Spring 2012 and Fall 2012 (Professor Robert Duvall)

Operating Systems, Spring 2013 (Professor Jeffery Chase)

Publications

Daniel S. Berger, Benjamin Berg, Timothy Zhu, Siddhartha Senn, and Mor Harchol-Balter.

RobinHood: Tail Latency Aware Caching -- Dynamic Reallocation from Cache-Rich to Cache-Poor. OSDI 2018.

Benjamin Berg, Jan-Pieter Dorsman, and Mor Harchol-Balter. *Towards optimality in parallel job scheduling.* ACM Sigmetrics 2018, Proceedings of the ACM on Measurement and Analysis of Computing Systems, Vol. 1.

The Case for Dynamic Cache Partitioning for Tail Latency. Poster presented at NSDI 2017. Daniel S. Berger, Benjamin Berg, Timothy Zhu, and Mor Harchol-Balter.

Talks

Benjamin Berg. *Towards optimality in parallel job scheduling.* Talk presented at INFORMS 2017.

Benjamin Berg. *Towards optimality in parallel job scheduling.* Talk presented at IFORS 2017.

Coursework

Graduate Coursework (Carnegie Mellon University)

- Performance Modeling of Computer Systems
- Advanced Stochastic Modeling
- Dynamic Programming
- Artificial Intelligence
- Advanced Algorithms

Undergraduate Coursework (Duke University)

- Operating Systems
- Computer Architecture
- Graduate Algorithms
- Combinatorics
- Software Design