Benjamin Berg
bsberg@cs.cmu.edu
781-248-9467

Research Interests

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

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: 3.865

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

Developer and Researcher, Production Kernel Team, Google — *Summer 2018*

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

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.

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)

Talks and Publications

Daniel S. Berger and 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*. Sigmetrics/POMACS 2018.

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

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

Projects and Research

Working with Ph.D. advisor Mor Harchol-Balter on applications of queuing theoretic models to the analysis of computer systems. Current projects include modeling of cache performance under various caching policies, and modeling the performance of multiprocessor systems working on parallelizable jobs.

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.

Worked with SIG assistant traders to complete quantitative analysis of trading opportunities related to long dated options on U.S. equities.

Wrote undergraduate thesis in the area of geometric algorithms with advisor Pankaj Agarwal, *Curve Simplification in the L-2 Norm*. Provided an algorithm to simplify large data sets, allowing them to be processed more efficiently while introducing minimal error.

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