Nathaniel Kell

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Objective

I am currently pursuing full-time positions in research, software engineering, and data science.

Education

Duke University, Durham, North Carolina — 2013-present
Ph.D. Student, Computer Science
GPA: 3.94/4.00

Denison University, Granville, Ohio — 2009-2013
B.S. Computer Science, B.A. Mathematics
Summa Cum Laude
GPA: 3.96/4.00

Publications

Sungin Im, Nathaniel Kell, Debmalya Panigrahi, Maryam Shadloo.
Online Load Balancing on Related Machines.
STOC 2018

Nathaniel Kell and Debmalya Panigrahi.
Online Budgeted Allocation with General Budgets.
EC 2016.

Sungjin Im, Nathaniel Kell, Janardhan Kulkarni, Debmalya Panigrahi.
Tight Bounds for Online Vector Scheduling.
FOCS 2015.

Jessen Havill and Nathaniel Kell.
Improved Upper Bounds for Online Malleable Job Scheduling.
Journal of Scheduling 18(4):393-410 2015.

Nat Kell and Matt Kretchmar.
Suspense at the Ballot Box.
The College Mathematics Journal, 44:1, pp. 9-16, 2013.

Work Experience

Google Research Intern (Mountain View) — Summer 2016
Host: Sreenivas Gollapudi
Project: Worked with Google Shopping Express team to design more accurate models for in-store layouts.

Honors and Awards

Outstanding Ph.D. Preliminary Exam Award — September 2016
Outstanding Ph.D. Research Initiation Project Award — September 2015

Phi Beta Kappa Inductee	May 2013
NSF Graduate Fellowship Honorable Mention	April 2013
Goldwater Scholar	March 2012
Vice President of Pi Mu Epsilon, Ohio Iota Chapter	February 2012
Upsilon Pi Epsilon Member, Ohio Delta Chapter	February 2012

Projects

Online Vector Scheduling: Design and analysis of schedulers for *vector* jobs, or jobs that load multiple independent resources (e.g. CPU, memory, network, etc.). The objective is typically to distribute jobs among a set of machines such that the largest load over all resources and all machines is minimized.

Budgeted Allocation: Design of algorithms for generalizations of the AdWords problem (online auctions for ad slots where advertisers have specified budgets). For example, we examine variants where bidders can specify finer-grained budgets for different ad campaigns and ones where the hosting sites attempts to simultaneously optimize revenue alongside other quality measurements (e.g. relevance of the ads to the users).

Malleable Job Scheduling: Analysis of schedulers for *malleable* jobs, or jobs that can be split among any subset of the available machines (usually used to model MapReduce jobs). We analyze models that account for the trade-off between parallelization speedup and added inter-machine communication.

Teaching

Teaching Assistant, COMPSCI 330: Design and Analysis of Algorithms
Spring 2018, Fall 2014

Teaching Assistant, COMPSCI 201: Data Structures and Algorithms
Spring 2014

Skills

Languages: Python, C++, C, Java
Tools: LaTeX

Presentations

Online Budgeted Allocation with General Budgets.
EC 2016, Maastricht, The Netherlands.

Tight Bounds for Online Vector Scheduling.
FOCS 2015, Berkeley, California, October 2015.

Online Budgeted Allocation with General Budgets.
Algorithms Seminar Lecture Series, Duke University, September 2015.

Tight Bounds for Online Vector Scheduling.
Algorithms Seminar Lecture Series, Duke University, January 2015.

An Optimal Algorithm for Online Malleable Job Scheduling.
Math and CS FaST Talks, Denison University, April 2013.

Investigation of Coloring Complexes in Hypergraphs.
Mathfest, Madison, Wisconsin, August 2012.

References

Debmalya Panigrahi (advisor), Assistant Professor of Computer Science, Duke University. Email: debmalya@cs.duke.edu

Bruce Maggs, Pelham Wilder Professor of Computer Science, Duke University. Email: bmm@cs.duke.edu

Sungjin Im, Assistant Professor of Electrical Engineering and Computer Science, University of California at Merced. Email: sim3@ucmerced.edu