Research Statement
I am interested in theoretical computer science, specifically approximation and online algorithms. I primarily focus on designing online algorithm for scheduling and resource allocation problems.

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 for Related Machines. (In submission)


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


Work Experience
Google (MTV) Software Engineering Intern Summer 2016
Host: Sreenivas Gollapudi
Project: Worked with Google Shopping Express team to design more accurate models for in-store layouts.

Current 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.

**Problems in 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, CS-330: Design and Analysis of Algorithms Fall 2014
- Teaching Assistant, CS-201: Data Structures/Algorithms Spring 2014

**Skills**
- Languages: Python, C++, C, Java, MATLAB, Sage
- Tools: LaTeX, Beamer

**Honors and Awards**
- Outstanding Ph.D. Preliminary Exam Award September 2016
- Outstanding Ph.D. Research Initiation Project Award (Department of Computer Science, Duke University) 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

**Presentations**
- Tight Bounds for Online Vector Scheduling. FOCS 2015, Berkeley, California, October 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 (Pi Mu Epsilon Session), 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