

# Ziv Scully

617-797-5382 • 5000 Forbes Ave, GHC 7121, Pittsburgh, PA 15213 • zscully@cs.cmu.edu

## Education

**Carnegie Mellon University**, *PhD, Computer Science* Pittsburgh, PA, 2016–present  
THESIS ADVISORS: Mor Harchol-Balter and Guy Blelloch.

Research in queueing theory, resource allocation, and scheduling. Received NSF Graduate Research Fellowship and ARCS Foundation scholarship.

**Massachusetts Institute of Technology**, *BS, Math with Computer Science* Cambridge, MA, 2012–2016  
SELECTED MATH COURSES: abstract algebra, real analysis, point-set topology, algebraic topology, logic and set theory, combinatorial optimization, algebraic combinatorics, theory of computation.

SELECTED COMPUTER SCIENCE COURSES: algorithm design, program analysis, large-scale symbolic systems, constructive computer architecture, microcomputer project lab, randomized algorithms, computational classical mechanics.

**Brookline High School** Brookline, MA, 2008–2012  
Siemens Competition Regional Semifinalist, Intel Science Talent Search Semifinalist, National Merit Scholarship Finalist.

## Research Experience

**Carnegie Mellon University**, *Graduate Research Assistant* Pittsburgh, PA, 2016–Present  
ADVISORS: Mor Harchol-Balter and Guy Blelloch.

Research in queueing theory, resource allocation, and scheduling. Interests include scheduling algorithms for complex jobs with multiple tasks and performance analysis of complex scheduling policies.

**Harvard Medical School**, *Research Intern* Boston, MA, Summer 2016  
ADVISOR: Walter Fontana.

Researched dynamic connectivity algorithms for KaSim, a simulator for protein interaction networks.

**MIT CSAIL**, *Undergraduate Researcher* Cambridge, MA, 2014–2016  
ADVISOR: Adam Chlipala.

Worked on Ur/Web, a pure functional programming language for web applications. Built a compiler optimization that automatically finds opportunities for caching SQL-query-backed output and implements both caching and corresponding cache invalidation.

**MIT PRIMES**, *Math Research Student* Cambridge, MA, 2011–2012  
Researched a discrete nonlinear dynamical system (2011) and matrix determinant algorithms for computer algebra (2012) in MIT PRIMES, a program to introduce high school students to math and science research.

## Teaching Experience

**Carnegie Mellon University**, *Teaching Assistant* Pittsburgh, PA, Fall 2016  
Led recitations and designed new course material for CMU 15-857, Analytical Performance Modeling.

**MIT Educational Studies Program**, *AP Physics C Teacher* Cambridge, MA, 2014–2015  
Together with a coteacher, taught weekly classes to local high school students in preparation for the Physics C Advanced Placement exam.

## Industry Experience

**Intentional Software Corporation**, *Software Developer Intern* Bellevue, WA, *Summer 2015*  
Became proficient with Intentional’s unique application platform and wrote product code using it, both individually and as part of a six-person team.

**Bridgewater Associates**, *Technology Associate Intern* Westport, CT, *Summer 2014*  
Completed a project in the trading department on a team with two other interns. Gained experience with machine learning and Hadoop.

**TripAdvisor**, *Software Engineering Intern* Newton, MA, *Summer 2013*  
Built customer-facing web pages, developed internal tools for customer service, and fixed a myriad of bugs as part of the Vacation Rentals team.

### Programming Language Skills

PROFICIENT: Haskell, Standard ML, C, Java, C#, Python, Ur/Web.

FAMILIAR: MIT Scheme, OCaml, JavaScript, 8051 assembly, Bluespec SystemVerilog, and others.

## Awards

**National Science Foundation Graduate Fellowship Program**, *Awardee* 2016–2019

**ARCS Foundation Scholarship**, *Recipient* 2016–2019

**PLDI 2016 Student Research Competition**, *Third Place* June 2016

**Intel Science Talent Search**, *Semifinalist* January 2012

**Siemens Competition**, *Regional Semifinalist* October 2011

## Publications and Preprints

### SOAP: One Clean Analysis of All Age-Based Scheduling Policies

Z. Scully, M. Harchol-Balter, and A. Scheller-Wolf (2018).

In *Proceedings of ACM SIGMETRICS 2018 Conference on Measurement and Modeling of Computer Systems* (SIGMETRICS 2018). Irvine, CA, USA, June 2018.

### Optimally Scheduling Jobs with Multiple Tasks

Z. Scully, G. Blleloch, M. Harchol-Balter, and A. Scheller-Wolf (2017).

In *Proceedings of the ACM Workshop on Mathematical Performance Modeling and Analysis* (MAMA 2017). Urbana, IL, USA, June 2017.

### A Program Optimization for Automatic Database Result Caching

Z. Scully and A. Chlipala (2017).

In *Proceedings of the 44th ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages* (POPL 2017). Paris, France, January 2017.

### Motors and Impossible Firing Patterns in the Parallel Chip-Firing Game

T.-Y. Jiang, Z. Scully, and Y. X. Zhang (2015).

*SIAM Journal on Discrete Mathematics*, 29(1), pp. 615–630.

PREVIOUS VERSION: *DMTCS Proceedings*, vol. AT, pp. 537–548.

### Efficient Calculation of Determinants of Symbolic Matrices with Many Variables

T. Khovanova and Z. Scully (2013).

arXiv:cs.SC/1304.4691.

## *Presentations and Posters*

<b>SIGMETRICS 2018</b> , <i>Paper and talk</i>	<i>June 2018</i>
<b>2017 INFORMS Annual Meeting</b> , <i>Invited talk</i>	<i>October 2017</i>
<b>2017 INFORMS APS Conference</b> , <i>Invited talk</i>	<i>July 2017</i>
<b>MAMA 2017</b> , <i>Extended abstract and talk</i>	<i>June 2017</i>
<b>POPL 2017</b> , <i>Paper and talk</i>	<i>January 2017</i>
<b>PLDI 2016 Student Research Competition</b> , <i>Talk and poster</i>	<i>June 2016</i>
<b>2012 MIT PRIMES Conference</b> , <i>Talk</i>	<i>May 2012</i>
<b>2012 MAA Undergraduate Student Poster Session</b> , <i>Poster</i>	<i>January 2012</i>
<b>2011 MIT PRIMES Conference</b> , <i>Talk</i>	<i>May 2011</i>

## *Other Activities*

**MIT Educational Studies Program**, *Program Director, Teacher* Cambridge, MA, 2012–present  
Codirected two educational programs for middle- and high-school students, Spring HSSP 2013 and ProveIt 2013–2014, and taught numerous classes to middle- and high-school students on a variety of math and programming topics (including aforementioned employment teaching AP Physics C).

**MIT Asymptones**, *President, Singer, Arranger* Cambridge, MA, 2012–2016  
Sang bass and arranged music for the Asymptones a cappella group. Served as group president in 2015.

**MIT Alpha Epsilon Pi Philanthropy**, *Logistics Lead, Committee Member* Cambridge, MA, 2013–2014  
Designed and ran AEPi's 2014 philanthropy campaign, which raised \$30,000 for Save a Child's Heart.