

# Ziv Scully

617-797-5382 • 5000 Forbes Ave, GHC 7121, Pittsburgh, PA 15206 • zscully@cs.cmu.edu

## Education

**Carnegie Mellon University**, *PhD Student, Computer Science* Pittsburgh, PA, 2016–present  
THESIS ADVISORS: Mor Harchol-Balter and Guy Blelloch.  
Research in queueing theory and performance modeling. 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.

## Publications and Preprints

### Optimally Scheduling Jobs with Multiple Tasks

Z. Scully, G. Blelloch, M. Harchol-Balter, and A. Scheller-Wolf (2017). In *Proceedings of the ACM Workshop on Mathematical Performance Modeling and Analysis* (MAMA '17).

### 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 '17). Association for Computing Machinery (ACM).

### 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), 615–630.

### Firing Patterns in the Parallel Chip-Firing Game

Z. Scully, T.-Y. Jiang, and Y. X. Zhang (2014). *DMTCS Proceedings*, (01), 537–548.

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

T. Khovanova and Z. Scully (2013). arXiv:cs.SC/1304.4691.

## Research Experience

**Carnegie Mellon University**, *Graduate Research Assistant* Pittsburgh, PA, 2016–Present  
ADVISORS: Mor Harchol-Balter and Guy Blelloch.  
Researching in queueing theory and performance modeling. Specifically, investigating optimal scheduling policies for complex jobs with multiple parts, where the job structure and performance requirement of each part may be known or unknown.

**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. Work in 2011 led to journal article in SIAM Journal of Discrete Mathematics.

## *Work 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.

**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.

**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*

<b>National Science Foundation Graduate Fellowship Program</b> , <i>Awardee</i>	<i>2016–2019</i>
<b>ARCS Foundation Scholarship</b> , <i>Recipient</i>	<i>2016–2019</i>
<b>PLDI 2016 Student Research Competition</b> , <i>Third Place</i>	<i>June 2016</i>
<b>Intel Science Talent Search</b> , <i>Semifinalist</i>	<i>January 2012</i>
<b>Siemens Competition</b> , <i>Regional Semifinalist</i>	<i>October 2011</i>

## *Presentations and Posters*

<b>2017 INFORMS Annual Meeting</b> , <i>Invited talk</i>	<i>October 2017</i>
<b>2017 INFORMS Applied Probability Meeting</b> , <i>Invited talk</i>	<i>July 2017</i>

<b>MAMA 2017</b> , <i>Short Paper 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.