

# DANIEL MILLER

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## Summary

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Math Ph.D. candidate at Cornell doing research in computational and statistical aspects of algebraic number theory. Work in bursts, beginning with focused reading of top current research, followed by test computations in Python or C, and discussion of “toy cases” with colleagues. Constructs a new theoretical setting that generalizes current work, and proves results in this new setting. Also have experience leading the creation of a scalable, distributed back-end for an Azure-hosted website. Interested in developing new methods for getting the most from existing large data sets.

## Education

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### Cornell University

#### PH.D. IN MATHEMATICS

August 2012–May 2017

- Coordinated logistics, teaching, and grading for a course with 300 students and 12 faculty.
- Assisted in teaching classes at undergraduate and graduate levels.
- Won the Eleanor Norton York Award for excellent collaboration and rapid research progress.

### Cornell University

#### MASTER'S IN COMPUTER SCIENCE

August 2015–May 2017

- Managed the creation of a location-centric auction site written in C#, using the ASP.NET framework. Ported it to Microsoft's Azure, and tested it for scalability to 2K requests per second.
- Collaborated in writing a CPU scheduler and gossip-based networking protocol in C.

### University of Nebraska Omaha

#### B.S. IN MATHEMATICS

August 2009–August 2012

- Minored in Computer Science, graduated *summa cum laude*.
- Dean's List all semesters, Highest Honors in Mathematics, with senior thesis.

## Research Experience

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### Computational statistics of elliptic curves

#### CORNELL UNIVERSITY (PHD)

August 2013–May 2017

- Developing and implementing new techniques for computing  $G$ -star discrepancy, used in numerical integration.
- Created sample sequences to disprove a conjecture on the discrepancy of data coming from elliptic curves.
- Proved precise connections between discrepancy of a sequence and analytic properties of an associated  $L$ -function.

### Arizona Winter School

#### UNIVERSITY OF ARIZONA

May 2014, May 2016

- Wrote scalable code to test a new version of the Lang–Trotter conjecture to high precision.
- Formulated and proved a generalized version of the Bertini Smoothness Theorem.

### Summer Mathematics Institute

#### CORNELL UNIVERSITY (UNDERGRADUATE)

Summer 2011

- Collaborated to create a high-dimensional example that disproved a conjecture.
- Published *Strongly non-embeddable metric spaces*. *Topology Appl.* **159** (2012), no.3, 749–755.
- Published *Polygonal equalities and virtual degeneracy in  $L_p$  spaces*. *J. Math. Anal. Appl.* **415** (2014), no.1, 247–268.

### SML...?

#### UNIVERSITY OF NEBRASKA OMAHA

Summer 2012

- Designed and wrote a compiler for a C-style programming language in Standard ML.

### Kerrigan Research Minigrants Program

#### UNIVERSITY OF NEBRASKA OMAHA

Spring 2011

- Investigated and computed a difficult counterexample in univalent function theory.

## Fund for Undergraduate Scholarly Experiences

UNIVERSITY OF NEBRASKA OMAHA

Summer 2012

- Streamlined the proof and statement of an important new result in Hopf–Galois module theory.

## Skills

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**Programming:** C#, Python, Java, ASP.NET, C, Sage, and  $\text{\LaTeX}$ .

**Web:** Azure, Amazon Web Services, HTML, and Google's Material Design Lite.

## Leadership

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**Resident Assistant**, *Chesterton House*. Coordinated events, finances, and recruiting for an academic living center.

**President**, *GCF*. Directed the event-planning, fund-raising, and leadership of a nonprofit campus organization.