

Daniel K. Miller

MATHEMATICIAN — DATA SCIENTIST

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Summary

My current work is on the statistical properties of the Satake parameters of elliptic curves and abelian 2-folds. The Sato–Tate conjecture (now proved by Taylor et. al.) states that the Satake parameters are equidistributed with respect to the Sato–Tate measure. Akiyama and Tanigawa made a conjecture on the precise nature of this distribution—namely a bound on the star-discrepancy of the sequence of Satake parameters. I have generalized this conjecture to arbitrary motives, and am proving a tight web of implications between variants of this conjecture and the analytic properties of a curious class of L -functions. I am also developing new techniques for the fast computation of star-discrepancy with respect to measures with non-convex CFDs.

Education

Cornell University

PH.D. IN MATHEMATICS

- Won the Eleanor Norton York Award.

Ithaca, NY

August 2012–PRESENT

Cornell University

MASTER'S IN COMPUTER SCIENCE

Ithaca, NY

August 2015–PRESENT

University of Nebraska Omaha

B.S. IN MATHEMATICS

- Minor in Computer Science.
- Graduated *summa cum laude*, with Highest Honors in Mathematics.
- Computed difficult counterexample in complex analysis with Valentin Matache under Kerrigan Research Minigrants Program.
- Research on Hopf–Galois theory with Griff Elder under the FUSE grant.
- Research in Nonlinear Functional Analysis with Anthony Weston at Cornell's Summer Mathematics Institute.

Omaha, NE

August 2009–July 2012

Publications

Casey Kelleher, Daniel Miller, Trenton Osborn, and Anthony Weston. Strongly non-embeddable metric spaces. *Topology Appl.*, 159(3):749–755, 2012.

Casey Kelleher, Daniel Miller, Trenton Osborn, and Anthony Weston. Polygonal equalities and virtual degeneracy in L_p -spaces. *J. Math. Anal. Appl.*, 415(1):247–268, 2014.

Work experience

Teaching Assistant

CORNELL UNIVERSITY

- Czar's Assistant for Calculus I and II.
- Teaching assistant for Honors Calculus II and Multivariable Calculus.
- Grader for Graduate Algebra I and II.

Ithaca, NY

August 2012–PRESENT

Resident Advisor

CHESTERTON HOUSE

- Coordinated living responsibilities and events for a household of 15 men.

Ithaca, NY

August 2013–May 2014

Tutor at the Math–Science Learning Center

UNIVERSITY OF NEBRASKA OMAHA

- Tutored undergraduate students in calculus, discrete math, and differential equations.

Omaha, NE

January 2012–May 2012

Relevant coursework and skills

Coursework: Algebraic topology — Cloud computing — Database management systems — Data structures — Functional programming — Linear algebraic groups — Object-oriented programming — Operating systems — Probability theory — Real analysis — Smooth manifolds

Programming: C — C# — Java — \TeX — Python