



(a forest of uniform spanning trees)

Samuel S. Watson

MATHEMATICIAN · DATA SCIENCE EDUCATOR

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Education

Massachusetts Institute of Technology

PHD MATHEMATICS

- MIT Presidential Fellowship · National Science Foundation Graduate Research Fellowship

Cambridge, Massachusetts

Sep 2010 - Jan 2015

Cambridge University

MMATH (PART III OF THE TRIPOS)

- Gates Cambridge Scholarship · Trinity College · Distinction

Cambridge, United Kingdom

Sep 2009 - Jun 2010

University of Mississippi

MS MATHEMATICS · BS MATHEMATICS AND PHYSICS · BA CLASSICS

- Sally McDonnell Barksdale Honors Scholarship · Taylor Medal

Oxford, Mississippi

Aug 2004 - May 2009

Mississippi School for Mathematics and Science

HIGH SCHOOL DIPLOMA

Columbus, Mississippi

Aug 2002 - May 2004

Experience

Brown University Data Science Initiative

DIRECTOR OF GRADUATE STUDIES

- Serve as director of Brown University's Master's Program in Data Science

Providence, Rhode Island

Jun 2017 - PRESENT

Brown University Department of Mathematics

TAMARKIN ASSISTANT PROFESSOR

- Conducted mathematical research and taught undergraduate courses in mathematics

Providence, Rhode Island

Jul 2015 - Jun 2018

Institute for Computational and Experimental Research in Mathematics

POSTDOCTORAL RESEARCHER

- Conducted research in semester program on *Phase transitions and emergent properties*

Providence, Rhode Island

Jan 2015 - May 2015

Art of Problem Solving

INSTRUCTOR AND CONTENT DEVELOPER

- Taught online courses
- Worked with a team to develop content for online math learning tools

San Diego, California

Aug 2009 - 2017

Phase Capital LP

ANALYST INTERN

- Built research infrastructure and analyzed portfolio allocation strategies at an asset management firm

Boston, Massachusetts

Jan 2014, Jun 2015 - Feb 2017

Microsoft Research

RESEARCH INTERN

- Conducted research in theoretical probability in the Theory Group at MSR

Redmond, Washington

Jun 2013 - Aug 2013

Research and Publications

Deep Learning

EDITOR: NATHAN CARTER

- Deep learning chapter in *Data Science for Mathematicians*

2020

Limit shapes for the asymmetric five vertex model

JOINT WORK WITH JAN DE GIER AND RICHARD KENYON

- Limit shapes and variational principles for a monotone non-intersecting lattice paths model

2019

Schnyder Woods, SLE(16), and Liouville Quantum Gravity

JOINT WORK WITH YITING LI AND XIN SUN

2017

- A convergence relationship between a classical discrete structure central to graph drawing and a canonical random surface in physics

Fractional Gaussian fields: a survey

JOINT WORK WITH ASAD LODHIA, SCOTT SHEFFIELD, AND XIN SUN

2014

- A survey of a general class of Gaussian fields which includes white noise, Brownian motion, and other important Gaussian fields as special cases. *Probability Surveys* 13 (2016): 1-56.

Seasonal life history adaptation in two species of *Drosophila*

JOINT WORK WITH EMILY L. BEHRMAN, KATHERINE R. O'BRIEN, M. SHANE HESCHEL, AND PAUL S. SCHMIDT

2014

- A mathematical model to analyze seasonal population dynamics in wild flies. *Journal of evolutionary biology* 28.9 (2015): 1691-1704

The extremes of the conformal loop ensemble

JOINT WORK WITH JASON MILLER AND DAVID WILSON

2013

- A computation of the size of the set of points surrounded by a given density of random fractal loops, for a canonical family of loop models. *Annals of Probability* 44.2 (2016): 1013-1052.

The conformal loop ensemble nesting field

JOINT WORK WITH JASON MILLER AND DAVID WILSON

2013

- Construction of a limiting random surface for height functions describing a canonical family of random fractal loops. *Probability Theory and Related Fields* 163.3-4 (2015): 769-801.

Rate of convergence in Cardy's formula

JOINT WORK WITH DANA MENDELSON AND ASAF NACHMIAS

2012

- A bound for the rate of convergence of crossing probabilities for monochromatic paths in a large honeycomb grid with randomly colored cells. *Communications in Mathematical Physics* 329.1 (2014): 29-56

Honors & Awards

2018	Teaching with Technology Award , Brown University	Providence, RI
2009	Gates Cambridge Scholarship	Cambridge, UK
2009	NSF Graduate Research Fellowship	Cambridge, MA
2006	Barry M. Goldwater Scholarship	Oxford, MS

Service

2018-2020	Panelist Brown University Academic Steering Committee	Providence, RI
2015-2019	Mathematics Instructor , MIT Office of Minority Education, <i>Interphase</i> summer program	Cambridge, MA
2016-2018	Co-organizer , Brown University Discrete Math Seminar	Providence, RI
2016-2017	Co-organizer , Horizons Seminar	Providence, RI
2014-2015	Co-organizer , MIT Integration Bee	Cambridge, MA
2011-2013	Mentor , MIT Directed Reading Program	Cambridge, MA
2011-2012	Assistant Instructor , Joy of Mathematics after-school enrichment	Cambridge, MA
2010	Volunteer Teaching Assistant , STIMULUS community service programme	Cambridge, UK
2009	Mississippi State Coach , National Mathcounts	Orlando, FL
2001-2014	Mathcounts Coach , North Delta, Heritage Academy, Oxford Middle, Academy of the Pacific Rim	USA
2006-2008	Problem Writer , University of Mississippi High School Mathematics Contest	Oxford, MS

Miscellaneous

Prismia	Co-developed a free, AI-powered classroom chat app
Data Gymnasia	Developed free and open source interactive data science learning platform
Julia package developer	Wrote <i>AsyPlots</i> , <i>PlanarMaps</i> , <i>ConformalMaps</i> , <i>VertexModels</i> , <i>FractionalGaussianFields</i>
Digital book author	Wrote course textbook <i>Multivariable Calculus: an introduction</i> , with interactive 3D graphics
Quora Top Writer	Recognized for answering questions about mathematics and other topics on popular website