Shanshan Ding

Contact Information

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Personal

Citizenship: USA

Research Interests

Discrete probability, stochastic processes, representation theory, algebraic and probabilistic combinatorics

Education

University of Pennsylvania (Sept 2008 - Jan 2014), Philadelphia, PA

Ph.D. in Mathematics

- Dissertation: *A Random Walk in Representations.* Advisor: Robin Pemantle
- Qualifying examination topics: probability (major), algebraic number theory (minor)

Columbia University (Sept 2004 - May 2008), New York, NY

B.A. with honors in Mathematics, B.A. in Economics, *cum laude*, May 2008

- Senior thesis: *Fourier analysis in number theory.* Advisor: Patrick Gallagher

Honors and Awards

Benjamin Franklin Fellowship, University of Pennsylvania, 2008-2013

Graduate Student Good Teaching Award, University of Pennsylvania, Fall 2012

Presidential Fellowship, University of Pennsylvania, Summer 2009

Publications

Tensor powers of the defining representation of S_n, J. Theoretical Probability, 30:3 (2017), 1191-1199

Smallest irreducible of the form $x^2 - dy^2$, Int. J. Number Theory, 5 (2009), pp 449-456

Selected Talks

"A representation-theoretic analysis of a Markov chain", Graduate Student Combinatorics Conference, University of Minnesota, April 2013

"A modified random transposition walk", 11th Northeast Probability Seminar, Columbia University, November 2012

"Dualism and geometry in music", Graduate Student Pizza Seminar, University of Pennsylvania, November 2011

"Fourier-analytic proof of Szemerédi's theorem" (in two parts), Additive Combinatorics Seminar, University of Pennsylvania, March 2011

"Number field sieve factorization", Prime Numbers Seminar, University of Pennsylvania, November 2010

"Markov chains in baseball", Graduate Student Combinatorics Seminar, University of Pennsylvania, November 2010

"Probabilistic number theory", Graduate Student Combinatorics Seminar, University of Pennsylvania, February 2010

"Primes of the form $x^2 + ny^2$", Undergraduate Mathematics Society, Columbia University, April 2008

"Splitting primes and irreducibles of the form $x^2 - dy^2$", REU presentation, University of Wisconsin-Madison, July 2007

Conferences Attended

PIMS Probability Summer School, University of British Columbia, June 2012

10th Northeast Probability Seminar, New York University, November 2011

7th Cornell Probability Summer School, Cornell University, July 2011

Columbia-Princeton Probability Day, Princeton University, April 2011

9th Northeast Probability Seminar, CUNY Graduate Center, November 2010

4th Graduate Student Probability Conference, Duke University, April-May 2010

Teaching Experience

University of Pennsylvania

Instructor

- Pre-Freshman Program: Engineering Math, Summer 2012
- Math 240: Calculus III, Summer 2011

Teaching assistant

- Math 114: Calculus II (online), Summer 2013
- Math 312: Linear Algebra, Spring 2013
- Math 104E: Calculus I for Engineers, Fall 2012
- Math 103: Introduction to Calculus, Spring 2012
- Math 203: Proving Things–Algebra, Spring 2011
- Math 500: Geometry and Topology I, Fall 2010
- Math 240: Calculus III, Spring 2010
- Math 114: Calculus II, Fall 2009

Elsewhere

Counselor, Program in Mathematics for Young Scientists, Boston University, Summer 2008

Grader, Math E1210: ODE, Columbia University, Fall 2007 and Spring 2008

Service

Master TA, Departmental TA Training Program, University of Pennsylvania, 2011-2013

Organizer, Additive Combinatorics Seminar, University of Pennsylvania, Spring 2011

Organizer, Undergraduate Mathematics Seminar, University of Pennsylvania, 2010-2011

Department representative to the graduate student government of the School of Arts and Sciences, University of Pennsylvania, 2009-2011

Computer Skills

Python, SQL, R, Stata, Maple, C++, HTML, Javascript, LaTeX

Languages

Chinese (fluent), French (intermediate), German (basic)