

Michael T. Lugo

CONTACT

INFORMATION

Department of Mathematics
University of Pennsylvania
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RESEARCH INTERESTS

Combinatorics, discrete probability, asymptotic analysis, stochastic processes.

RESEARCH EXPERIENCE

University of Pennsylvania, Philadelphia, PA, USA

- 2007-2010: PhD candidate. Thesis title: Profiles of large combinatorial structures. Advisor: Robin Pemantle.
- Quantum random walks summer research group. Supervisor: Robin Pemantle. June-August 2007.

Massachusetts Institute of Technology, Cambridge, MA, USA

- Undergraduate Research Opportunities Program. Advisor: Igor Pak. June-August 2004. Project title: The Local Move Problem and Tiling Invariants.

PUBLICATIONS

Michael Lugo. Profiles of permutations. *Electronic Journal of Combinatorics* 16 (2009) #R 99, 20 pages.

PREPRINTS

Michael Lugo. Bulk profiles of permutations. Preprint. [arxiv:0909.2909](https://arxiv.org/abs/0909.2909), 15 pages.

Michael Lugo. The cycle structure of compositions of random involutions. Preprint. [arxiv:0911.3604](https://arxiv.org/abs/0911.3604), 17 pages.

PUBLICATIONS IN PREPARATION

Michael Lugo. Order statistics in combinatorial structures. In preparation.

Michael Lugo. Further examples of weighted permutations. In preparation.

Michael Lugo. Asymptotic of generalized partition ideals. In preparation.

TALKS GIVEN

Singularity analysis and analytic combinatorics of discrete random structures. Cornell University probability seminar (joint meeting with combinatorics seminar), February 2010.

The cycle structure of compositions of random involutions. Univ. of PA graduate student combinatorics seminar, October 2009.

The class multiplication problem. Univ. of PA graduate student combinatorics seminar, March 2009.

Recounting the rationals. Univ. of PA undergraduate mathematics seminar, March 2009.

Recounting the rationals. Univ. of PA mathematics grad student pizza seminar, December 2008.

The generation of large random structures. Univ. of PA graduate student combinatorics seminar, November 2008.

Profiles of permutations. Univ. of PA combinatorics and probability seminar, October 2008.

Profiles of permutations. Univ. of PA graduate student combinatorics seminar, October 2008.

An introduction to negative dependence. Univ. of PA combinatorics and probability seminar, February 2008.

An introduction to probabilistic combinatorics. Univ. of PA mathematics grad student pizza seminar, November 2005.

CONFERENCES

ATTENDED

November 2009. 8th Northeastern Probability Seminar. Columbia University, New York.

July 2009. 5th Cornell Probability Summer School, Cornell University, Ithaca, NY.

January 2009. Workshop on Analytic Algorithmics and Combinatorics, New York.

November 2007. Quantum random walks workshop, University of Pennsylvania, Philadelphia.

EDUCATION

University of Pennsylvania, Philadelphia, PA, USA

Ph. D., Mathematics (thesis defended April 15, 2010; final version to be submitted)

- Thesis Topic: Profiles of large combinatorial structures
- Advisor: Robin Pemantle

Graduate-level coursework in combinatorics and probability:

- Fall 2005, combinatorial analysis and graph theory. Professor: Miklos Bona. Text: Stanley, Enumerative Combinatorics, volume 1.
- Spring 2006, asymptotics of multivariate generating functions. Professor: Robin Pemantle.
- Fall 2006, analytic combinatorics. Professor: Mark Ward. Text: Flajolet and Sedgewick, Analytic Combinatorics.
- Fall 2006/Spring 2007, probability theory and stochastic processes. (graduate-level, measure theoretic). Professor: Robin Pemantle. Text: Durrett, Probability, Theory and Examples.
- Spring 2007, the probabilistic method. Professor: David Galvin. Text: Alon and Spencer, The Probabilistic Method.
- Fall 2007, determinantal point processes and random partitions. Professor: Grigory Olshansky.
- Fall 2007, probability theory and machine learning. Professor: J. Michael Steele.
- Spring 2008, theory of combinatorial species. Professor: Marko Petkovsek.
- Spring 2008, analysis of algorithms. Professor: Sudipto Guha. Text: Kleinberg and Tardos, Algorithm Design.
- Fall 2008, stochastic calculus and financial applications (audited). Professor: J. Michael Steele. Text: Steele, Stochastic Calculus and Financial Applications.

Massachusetts Institute of Technology, Cambridge, MA, USA

S. B., Mathematics and S. B., Chemistry, June 2005.

Graduate-level coursework:

- Fall 2004, Combinatorics of hyperplane arrangements. Professor: Richard Stanley.

TEACHING
EXPERIENCE

University of Pennsylvania, Philadelphia, PA, USA

Earned Teaching Certificate from the Center for Teaching and Learning, Fall 2009.

Instructor, Math 170: Ideas in mathematics, Summer 2009.

Sole instructor for mathematics course for liberal arts students. Designed a survey course covering basic number theory, the nature of infinity, discrete geometry, fractals and chaos, and basic probability. Gave daily lectures, wrote and graded homework and exams.

Instructor, Math 104: Calculus I, Summer 2006.

Sole instructor for calculus course. Gave daily lectures, wrote and graded homework and exams.

Teaching assistant:

- Math 361: Advanced Calculus, Fall 2009.

Second-semester real analysis, for junior/senior math majors. Taught two two-hour problem sessions per week, discussing homework and strategies of problem solving and proof with students. Graded homework of approximately 20 students.

- Math 170: Ideas in Mathematics, Spring 2008.
- Math 114: Calculus II, Fall 2007.
- Math 114: Calculus II, Spring 2007.
- Math 104: Calculus I, Fall 2006

Taught four one-hour recitations per week, graded homework and quizzes of approximately 80 students per semester, assisted in grading of exams.

Grader

- Math 501: Differential Geometry, Spring 2010

Graded weekly problem sets.

Staffer, Math Help Center, Summer 2007, Fall 2008, Spring 2009.

Walk-in center where undergraduates in any math course can ask questions.

Private tutoring for undergraduates in calculus and probability courses.

Massachusetts Institute of Technology, Cambridge, MA, USA

Grader

- 18.01A: Calculus I (Accelerated), Fall 2004.
- 18.03: Differential Equations, Spring 2005.

Graded weekly problem sets of approximately 40 students, assisted in grading of exams.

REFERENCES

Robin Pemantle, University of Pennsylvania, pemantle@math.upenn.edu (thesis advisor)

Miklos Bona, University of Florida, bona@math.ufl.edu

Herb Wilf, University of Pennsylvania, wilf@math.upenn.edu

Igor Pak, University of California, Los Angeles, pak@math.ucla.edu

Antonella Grassi, University of Pennsylvania, grassi@math.upenn.edu (teaching)