Yufei Zhao

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Department of Mathematics, MIT
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Education

Massachusetts Institute of Technology — Cambridge, MA
Candidate for Ph.D. in Mathematics. Advisor: Jacob Fox — 9/2011–6/2015 (expected)

University of Cambridge — Cambridge, UK
M.A.St. Mathematics with Distinction — 10/2010–6/2011

Massachusetts Institute of Technology — Cambridge, MA
B.Sc. Mathematics, with minor in Economics. — 9/2006–6/2010
B.Sc. Computer Science and Engineering. GPA: 5.0/5.0.

Research Interests

Extremal/probabilistic/additive combinatorics; graph theory and graph limits; sphere packing

Selected Awards and Honors

Microsoft Research PhD Fellowship 2013–2015

MIT Akamai Presidential Fellowship 2011–2012

Leslie Walshaw Prize, Examination Prize, and Senior Scholarship, Trinity College, Cambridge, 2011
for top results in Cambridge Part III Mathematics examinations

Morgan Prize Honorable Mention, 2011
for outstanding research in mathematics by an undergraduate student

Gates Cambridge Scholarship, 2010–2011

MIT Jon A. Bucsela Prize in Mathematics, 2010
awarded to the top graduating senior in the MIT Mathematics Department.

William Lowell Putnam Mathematics Competition
Three-time Putnam Fellow (top five ranking) 2006, 2008 and 2009; Seventh Place 2007

International Mathematical Olympiad: Gold Medal 2005; Silver Medal 2006; Bronze Medal 2004

USA Mathematical Olympiad: Third Place 2005 and 2006

Canadian Mathematical Olympiad: First Place 2004

Research Internships

Microsoft Research New England — Cambridge, MA
Mentor: Henry Cohn — Summers 2010, 2011, 2013, 2014

Microsoft Research Theory Group — Redmond, WA
Mentor: Eyal Lubetzky — Summer 2012

Papers

20. D. Conlon, J. Fox, and Y. Zhao. The Green-Tao theorem: an exposition.
Preprint arXiv:1403.2957.

19. E. Lubetzky and Y. Zhao. On the variational problem for upper tails in sparse random graphs.
Preprint arXiv:1402.6011.

18. C. Borgs, J. T. Chayes, C. Cohn, and Y. Zhao. An L^p theory of sparse graph convergence I: limits, sparse random graph models, and power law distributions. Preprint arXiv:1401.2906.

17. Y. Zhao. An arithmetic transference proof of a relative Szemerédi theorem.
Math. Proc. Cambridge Philos. Soc. 156 (2014), 255–261.

16. J. Fox and Y. Zhao. A short proof of the multidimensional Szemerédi theorem in the primes.
Amer. J. Math., to appear.

15. D. Conlon, J. Fox, and Y. Zhao. A relative Szemerédi theorem.
Preprint arXiv:1305.5440.

14. Y. Zhao. Hypergraph limits: a regularity approach.
Random Structures Algorithms, to appear.

13. H. Cohn and Y. Zhao. Sphere packing bounds via spherical codes.
Duke Math. J., 163 (2014), 1965–2002.

12. H. Cohn and Y. Zhao. Universally optimal error-correcting codes.
Preprint arXiv:1212.1913.

11. E. Lubetzky and Y. Zhao. On replica symmetry of large deviations in random graphs.
Random Structures Algorithms, to appear.

10. J. Fox, P. Loh, and Y. Zhao. The critical window for the classical Ramsey-Turán problem.
Combinatorica, to appear.

9. D. Conlon, J. Fox, and Y. Zhao. Extremal results in sparse pseudorandom graphs.
Adv. Math. 256 (2014), 206–290.

8. Y. Zhao. The bipartite swapping trick on graph homomorphisms.
SIAM J. Discrete Math. 25 (2011), 660–680.

7. Y. Zhao. Subsets characterized by the number of missing sums and differences.
J. Number Theory 11 (2011), 2107–2134.

6. D. Galvin and Y. Zhao. The number of independent sets in graphs with small maximum degree.
Graphs Combin. 27 (2011), 177–186.

5. Y. Zhao. Counting MSTD sets in finite abelian groups.
J. Number Theory 130 (2010), 2308–2322.

4. Y. Zhao. Constructing numerical semigroups of a given genus.
Semigroup Forum 80 (2010), 242–254.

3. Y. Zhao. Constructing MSTD sets using bidirectonal ballot sequences.
J. Number Theory 130 (2010), 1212–1220.

2. Y. Zhao. The number of independent sets in a regular graph.
Combin. Probab. Comput. 19 (2010), 315–320.

1. Y. Zhao. The coefficients of a truncated Fibonacci power series.
Fibonacci Quart. 46/47 (2009), 53–55.

Invited Talks

Upcoming:

2015	ICERM workshop: Crystals, Quasicrystals and Random Networks	Providence, RI
2014	Atlanta Lectures Series in Combinatorics and Graph Theory at Emory	Atlanta, GA
	CRM workshop: New Topics in Additive Combinatorics	Montreal, QC
	IMA workshop: Additive and Analytic Combinatorics	Minneapolis, MN

Previous:

	Clay Math Institute workshop: Extremal and Probabilistic Combinatorics	Oxford, UK
	Georgia Tech Combinatorics Seminar	Atlanta, GA
	IAS Computer Science/Discrete Mathematics Seminar	Princeton, NJ
	Oxford Combinatorial Theory Seminar	Oxford, UK
	London School of Economics Discrete Mathematics and Game Theory Seminar	London, UK
	Eurandom: **Minicourse** on Graph Limits (6-hour minicourse co-taught with Christian Borgs)	Eindhoven, Netherlands
	Oberwolfach workshop: Combinatorics	Oberwolfach, Germany
2013	Simons Institute workshop: Neo-Classical Methods in Discrete Analysis	Berkeley, CA
	Rutgers Discrete Math Seminar	Piscataway, NJ
	MIT Combinatorics Seminar	Cambridge, MA
	Yale Combinatorics and Probability Seminar	New Haven, CT
	Microsoft Research Theory Reading Group	Cambridge, MA
	Oberwolfach workshop: Combinatorics and Probability	Oberwolfach, Germany
2012	MIT Combinatorics Seminar	Cambridge, MA
	SIAM Conference on Discrete Mathematics	Halifax, NS
2009	MIT Combinatorics Seminar	Cambridge, MA

Teaching

Spring 2013 MIT 18.03 Differential Equations — Recitation Instructor

Other Experience and Activities

Deputy leader for Canadian IMO Team — 2008

Instructor at Canadian IMO Training Camps — various summers and winters

Mentor at AwesomeMath Summer Program — Summer 2007

Trainer at Math Olympiad Summer Program — Summer 2007

Teacher at Spirit of Math Schools in Toronto — 2005–2006

CV Updated: July 14, 2014