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Education

Ph.D., Business Economics, Harvard University (2009–present).

Advisors: Alvin E. Roth, Andrei Shleifer, Drew Fudenberg, Susan Athey, and E. Glen Weyl.

A.M., Business Economics, Harvard University (2010).

A.B., Mathematics, Harvard University, *summa cum laude* (2009).

Minor: Ethnomusicology.

Thesis: “Weighted Generating Functions and Configuration Results for Type II Lattices and Codes.”

Advisor: Noam D. Elkies.

Employment

Research

- Social Science Analyst, Economic Analysis Group, US Department of Justice (Summer 2010).
- Research Assistant to Prof. Edward Glaeser, Dept. of Economics, Harvard University (2007–2009).
- Research Assistant to Prof. William R. Kerr, Harvard Business School (2008–2009).
- Research Assistant to Prof. Susan Athey, Dept. of Economics, Harvard University (Summer 2008).
- Research Assistant to Prof. Andrei Shleifer, Dept. of Economics, Harvard University (Spring 2008).
- Operations Research Engineering Intern, Google (Summer 2007).

Teaching and Advising

- Non-resident Tutor, Kirkland House, Harvard University (2009–present).
- Paper Reviewer, Research Science Institute, MIT (2005–present).
- Program Assistant, Harvard College PRISE (Summer 2008).
- Course Assistant, Mathematics 25a, Harvard University (Fall 2006).
- Teaching Assistant, Research Science Institute, MIT (Summer 2006).
- Counselor, Research Science Institute, MIT (Summer 2005).

Academic Activities

Affiliations

- John M. Olin Center for Law, Economics, and Business (2010–present).
- Harvard EconCS Group (2009–present).
- Harvard Institute for Quantitative Social Science (2008–present).

Organizational

- Co-organizer, “Frontiers of Matching Theory” session, AEA Meetings (2011).

Refereeing

- Economics: *Economics Letters*, *International Journal of Industrial Organization*, *Public Choice*.
- EconCS: *Annual Symposium on Foundations of Computer Science (FOCS)*, *International Workshop on Computational Social Choice (COMSOC)*.
- Mathematics: *The American Mathematics Competition*.

Editorial

- Editor Emeritus, *The Harvard College Mathematics Review* (2008–present).
- Editor-In-Chief, *The Harvard College Mathematics Review* (2006–2008).

Honors

Research Fellowships

- National Science Foundation Graduate Research Fellowship (2009–2011).
- Terence M. Consideine Fellowship in Law and Economics (2010–2011).
- Yahoo! Key Scientific Challenges Program Fellowship (2010–2011).
- Danielan Fund Research and Travel Grant (2010).
- Harvard Real Estate Academic Initiative Faculty Grant (with E. Glen Weyl, 2009–2010).
- National Defense Science and Engineering Graduate Fellowship (declined, 2009).
- Harvard Institute for Quantitative Social Science Summer Scholars Program Fellowship (2008).
- Harvard College Program for Research in Science and Engineering Fellowship (2008).
- Harvard Mathematics Department Highbridge Fellowship (2008).
- Harvard College Program for Research in Science and Engineering Fellowship (2006).
- Research Support from the Harvard University Department of Music (2006).
- Center for Excellence in Education Research Science Institute Summer Scholarship (2004).

Awards

- Yahoo! Key Scientific Challenges Program Selectee (2010).
- St. Mark's Institute of Mathematics Great Math Challenge Award (with Paul M. Kominers, 2010).
- AMS-MAA-SIAM Frank and Brennie Morgan Prize for Outstanding Research in Mathematics by an Undergraduate Student (2010).
- George Caspar Homans Prize (2009).
- Thomas Temple Hoopes Prize (2009).
- Phi Beta Kappa (2009).
- Finalist, Harvard Commencement Orations Competition (2009).
- First Place, Robert Fletcher Rogers Prize (2008).
- John Harvard Scholarship (2007–2008).
- First Place, American Mathematical Society Karl Menger Prize (2005).
- Second Place, Mathematics Category, Intel International Science and Engineering Fair (2005).
- First Alternate, American Committee for the Weizmann Institute of Science ISEF Scholarship (2005).
- California Institute of Technology Signature Award in Mathematics (2004).

Invited Workshops

- Economic Research Initiatives at Duke (ERID) Conference on Roth and Sotomayor (2010).
- 24th Bellairs Invitational Winter Workshop on Computational Geometry (2009).

Publications

Refereed Economics Research Papers

- “Matching in Networks with Bilateral Contracts,” (with John William Hatfield), extended abstract, *Proceedings of the 11th ACM Conference on Electronic Commerce (EC’10)*, (2010).
- “Information Can Wreck Cooperation: A Counterpoint to Kandori (1992),” (with Yuichiro Kamada), *Economics Letters*, 107(2), (2010): 112–114.
- “Matching with Preferences over Colleagues Solves Classical Matching,” *Games and Economic Behavior*, 68(2), (2010): 773–780.
- “Dynamic Position Auctions with Consumer Search,” *Proceedings of The 5th International Conference on Algorithmic Aspects in Information and Management (AAIM), Lecture Notes in Computer Science*, 5564, (2009): 240–250.

Refereed Mathematics Research Papers

- “Hinged Dissections Exist,” (with Timothy G. Abbott, Zachary Abel, David Charlton, Erik D. Demaine, and Martin L. Demaine), forthcoming, *Discrete & Computational Geometry*. (Conference paper, *Proceedings of the Twenty-fourth Annual Symposium on Computational Geometry*, (2008): 110–119.)
- “Every Large Point Set contains Many Collinear Points or an Empty Pentagon,” (with Zachary Abel, Brad Ballinger, Prosenjit Bose, Sébastien Collette, Vida Dujmović, Ferran Hurtado, Stefan Langerman, Attila Pór, and David R. Wood), forthcoming, *Graphs and Combinatorics*. (Extended abstract, *Proceedings of the 21st Canadian Conference on Computational Geometry*, (2009).)
- “A Categorical Construction of Ultrafilters,” (with Daniel Litt and Zachary Abel), forthcoming, *Rocky Mountain Journal of Mathematics*.
- “A Constant Bound for the Periods of Parallel Chip-firing Games with Many Chips,” (with Paul M. Kominers), *Archiv der Mathematik*, 95(1), (2010): 9–13. (Recognized in the St. Mark’s Institute of Mathematics Great Math Challenge.)
- “On Congruence Conditions for Primality,” (with Sherry Gong), *INTEGERS: The Electronic Journal of Combinatorial Number Theory*, 10(3), (2010): 313–317.
- “Irrational Roots Revisited,” *The Mathematical Gazette*, 94(530), (2010): 28.
- “On the Classification of Type II Codes of Length 24,” (with Noam D. Elkies), *SIAM Journal on Discrete Mathematics*, 23(4), (2010): 2173–2177.
- “Further Improvements of Lower Bounds for the Least Common Multiples of Arithmetic Progressions,” (with Shaofang Hong), *Proceedings of the American Mathematical Society*, 138(3), (2010): 809–813.
- “Improved Bounds on the Sizes of S-P Numbers,” (with Paul M. Kominers), *The Mathematical Gazette*, 94(529), (2010), (2010): 127–129.
- “Shape Replication Through Self-Assembly and RNase Enzymes,” (with Zachary Abel, Nadia Benbernou, Mirela Damian, Erik D. Demaine, Robin Flatland, Robert Schweller, and Martin L. Demaine), *Proceedings of the 2010 ACM-SIAM Symposium on Discrete Algorithms*, (2010).
- “Refined Configuration Results for Extremal Type II Lattices of Ranks 40 and 80,” (with Noam D. Elkies), *Proceedings of the American Mathematical Society*, 138(1), (2010): 105–108.
- “Configurations of Extremal Even Unimodular Lattices,” *International Journal of Number Theory*, 5(3), (2009): 457–464.
- “On Universal Binary Hermitian Forms,” *INTEGERS: The Electronic Journal of Combinatorial Number Theory*, 9, (2009): 9–15.
- “Configurations of Rank- $40r$ Extremal Even Unimodular Lattices ($r = 1, 2, 3$),” (with Zachary Abel), *Journal de Théorie des Nombres de Bordeaux*, 20(2), (2008): 365–371.
- “Uniqueness of the 2-universality Criterion,” *Note di Matematica*, 28(2), (2008): 203–206.

Refereed Musicology Research Papers

- “Leonard Bernstein’s Doodles: Reading Outside the Lines at the Library of Congress,” *Journal of the Society for American Music*, 3(1), (2009): 26–33. (As an appendix to “Leonard Bernstein’s Jewish Boston: Cross-Disciplinary Research in the Classroom” by Carol J. Oja and Kay Kaufman Shelemay.)
- “Leonard Bernstein doodled regularly,” In: *Bernstein and Boston: A Documentary Scrapbook* (Emily Abrams Ansari ed., 2006).

Refereed Comments (selected)

- “A correspondence note on Myerson’s ‘Irrationality via Well-ordering’,” *Gazette of the Australian Mathematical Society*, 36(1), (2009): 53.

Expository Articles (selected)

- “Finding Matrices Which Satisfy Functional Equations,” *College Mathematics Journal*, 40(4), (2009): 289–292.
- “Endpaper: Math Has This Funny Property,” (with Zachary Abel), *The Harvard College Mathematics Review*, 2(1), (2008): 101.
- “Mathematical Minutiae: i Has This Funny Property,” (with Zachary Abel), *The Harvard College Mathematics Review*, 2(1), (2008): 75–77.
- “The Harvard College Mathematics Review: A New Undergraduate Expository Journal,” (with Daniel Litt), *Math Horizons*, 15(4), (2008): 30–31.

Refereed Problems and Solutions (selected)

- *American Invitational Mathematics Exam (AIME)*: Problem II-10 (2010); Problem II-7 (2009).
- *College Mathematics Journal*: Problem 908 (2009).
- *Pi Mu Epsilon Journal*: Problem 1213 (with Paul M. Kominers, 2009); Problem 1192 (2008); Solutions to problems 1175 (with Paul M. Kominers, 2008) and 1176 (with Paul M. Kominers, 2008).
- *Mathematics Magazine*: Problem Q987 (2009).
- *Alfred R. Schmidt Freshman Mathematics Competition*: Exams 20 (with John Rickert and Paul M. Kominers, 2008), 19 (with John Rickert and Paul M. Kominers, 2007) and 17 (with John Rickert, 2005).

Working Papers (selected)

Economics

- “Concordance among Holdouts,” (with E. Glen Weyl).
- “Stability and Competitive Equilibrium in Trading Networks,” (with John William Hatfield, Alexandru Nichifor, Michael Ostrovsky, and Alexander Westkamp).
- “Matching in Networks with Bilateral Contracts,” (with John William Hatfield).
- “Contract Design and Stability in Matching Markets,” (with John William Hatfield).
- “Second-order Critical Loss Analysis,” (with Carl Shapiro).
- “Tipping Points and Agglomeration Bubbles,” (with William R. Kerr).
- “Sticky Content and the Structure of the Commercial Web.”
- “Salary Erosion and Federal Judicial Resignation,” revise and resubmit, *International Review of Law and Economics*.

Mathematics

- “The 8-universality Criterion is Unique.”
- “Pushing Hypercubes Around,” (with Zachary Abel).

Presentations

Research Lectures

- "Concordance among Holdouts," upcoming, Yahoo! Key Scientific Challenges Graduate Student Summit, September 9, 2010.
- "Concordance among Holdouts," Economic Analysis Group, Antitrust Division, US Department of Justice, August 12, 2010.
- "Matching in Networks with Bilateral Contracts," 11th ACM Conference on Electronic Commerce (EC'10), June 9, 2010.
- "Concordance among Holdouts," Harvard Business School Market Design Workshop, May 14, 2010.
- "Concordance among Holdouts," Harvard Workshop on Research in Behavior in Games and Markets, April 21, 2010.
- "Contract Design and Stability in Matching Markets," University of Chicago Informal Labor Economics Seminar, April 7, 2010.
- "Matching in Networks with Bilateral Contracts," Northwestern EECS Economics Group Theory Seminar, April 5, 2010.
- "Matching in Networks with Bilateral Contracts," Harvard Business School Negotiation, Organizations, & Markets Group Ad-Hoc Research Seminar, February 22, 2010.
- "Configurations of Extremal Type II Lattices and Codes," Morgan Prize Lecture, AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, Joint Mathematics Meetings, January 15, 2010.
- "Matching in Networks with Bilateral Contracts," Stanford University Market Design Workshop, January 8, 2010.
- "Higher Generalized Matching," Guest lecture, Harvard Economics 2056a: Market Design, November 20, 2009.
- "Matching in Networks with Bilateral Contracts," Harvard SEAS Economics and Computer Science Research Seminar, November 19, 2009.
- "Many-to-many Matching with Contracts," Harvard Workshop on Research in Behavior in Games and Markets, November 18, 2009.
- "Concordance among Holdouts," Harvard Graduate Student Political Economy Workshop, November 6, 2009.
- "Concordance among Holdouts," Harvard Law & Economics Seminar, November 5, 2009.
- "Sticky Content and the Structure of the Web," 2009 Workshop on The Economics of Networks, Systems, and Computation (NetEcon'09), July 7, 2009.
- "Dynamic Position Auctions with Consumer Search," 5th International Conference on Algorithmic Aspects in Information and Management (AAIM 2009), June 16, 2009.
- "Sticky Content and the Structure of the Web," Harvard SEAS Economics and Computer Science Research Seminar, April 30, 2009.
- "Koch's Condition on Type II Codes of Length 24," Harvard University Mathematics Table, April 14, 2009.
- "Using Matching with Preferences over Colleagues to Solve Classical Matching Problems," Plenary talk session, Inaugural Boston Undergraduate Research Symposium, April 11, 2009.
- "Clubs, Beliefs, and Entrapment," American Mathematical Society Session on Behavioral Sciences, Joint Mathematics Meetings, January 7, 2009.
- "Using Matching with Preferences over Colleagues to Solve Classical Matching Problems," Harvard Business School Negotiation, Organizations, & Markets Group Ad-Hoc Research Seminar, December 15, 2008.

- "Dynamic Position Auctions with Consumer Search," Harvard SEAS Economics and Computer Science Research Seminar, November 4, 2008.
- "Configurations of Extremal Even Unimodular Lattices," MathFest 2008 Student Paper Session, August 1, 2008.
- "Configurations of Extremal Even Unimodular Lattices," Brown University Symposium for Undergraduates in the Mathematical Sciences, March 8, 2008.
- "Leonard Bernstein's Doodles: Grasping Genius Through Graphology," Guest lecture, Harvard Freshman Seminar 34m, February 13, 2008.
- "Word-painting in Gregorian Chant: A Computer-assisted Study," Chant Symposium, Harvard Music 191r: Sources of Gregorian Chant, December 12, 2007.
- "Configurations of Extremal Even Unimodular Lattices," Harvard Undergraduate Research Symposium, November 11, 2006.
- "Leonard Bernstein's Doodles: Grasping Genius Through Graphology," Leonard Bernstein, Boston to Broadway: Concerts and Symposia at Harvard University, October 14, 2006. Archived In: *In the Beginning: Becoming Bernstein: Students from a Harvard University Research Project Exploring Bernstein's Boston Ties*, Carol Oja and Kay Kaufmann Shelemay, moderators, In: *Leonard Bernstein, Boston to Broadway*, Harvard University, (2006), disks 11-12.
- "Configurations of Extremal Even Unimodular Lattices," Harvard College Program for Research in Science and Engineering, August 23, 2006.
- "On Universality Properties of Positive-Definite Integral Quadratic Forms," Harvard Math 99r: Tutorial on Binary Quadratic Forms, January 6, 2006.
- "On Universality Properties of Positive-Definite Integral Quadratic Forms," Intel International Science and Engineering Fair, May 12, 2005. Awarded the top Karl Menger Prize and the Second Place Grand Award in the mathematics category.
- "On Universality Properties of Positive-Definite Integral Quadratic Forms," University of Maryland Junior Sciences and Humanities Symposium, March 1, 2005.
- "On Universality Properties of Positive-Definite Integral Quadratic Forms," Research Science Institute, July 29, 2004.

Expository Lectures (selected)

- "Microeconomics in 50 Minutes," MIT Splash, November 11, 2009.
- "How much do you Bid?," Guest lecture, The Math Circle, May 3, 2009.
- "Why matchmakers?," Guest lecture, The Math Circle, December 7, 2008.
- "Matchmaker, Matchmaker, Clear Out My House (an introduction to the theory of matching)," Harvard University Mathematics Table, November 11, 2008.
- " $C = 15$ (new and old results of quadratic form representation theory)," Harvard University Mathematics Table, October 20, 2007. Awarded the top Robert Fletcher Rogers Prize.

August 17, 2010