Philip S. Chodrow

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I am an applied mathematician developing models and methods for studying adaptive complex systems. My methodological interests include stochastic processes, information theory, and spatial statistics. My application areas include network inference; opinion dynamics; demographic segregation; and estimation problems in spatial growth processes.

Education

2015-	**Ph.D. Candidate** in Operations Research, MIT. Expected graduation May, 2020.
2008-12	**B.A. with High Honors** in Mathematics and Philosophy, Swarthmore College.

Recognitions and Honors

2017-20	**NSF Graduate Research Fellowship** supporting research in modeling difference, disparity, and group dynamics in social systems.
2018	**Goodwin Award Nominee** by MIT Operations Research Center for "conspicuously effective teaching."
2012	**Fulbright Scholarship** supporting a year of research in Oslo, Norway.
	Ivy Award "recognizing the man of the graduating class who is outstanding in leadership, scholarship, and contributions to the Swarthmore College community."
	Phi Beta Kappa inducted member.
	Brinkmann Award recognizing "the best student paper on a mathematical subject."
2010	**Eugene Lang Summer Initiative Grant**, supporting a summer of undergraduate research.

Selected Papers

2019	Chodrow, P. S. (2019). Configuration models of random hypergraphs and their applications. *arXiv: 1902.09302v2*

	Schwarze, A. C., Chodrow, P. S., and Porter, M. A. (2019). Log-minor distributions and an application to estimating mean subsystem entropy. *arXiv: 1901.09456*
2018	Chodrow, P. S. and Mucha, P. J. (2018). Local symmetry and global structure in adaptive voter models. *In Review*
	Strano, E., Chodrow, P. S., and González, M. C. (2018). Heterogeneous dynamics of human settlement. *In Preparation*
2017	Chodrow, P. S. (2017b). Structure and information in spatial segregation. *Proceedings of the National Academy of Sciences*, 114(44)
	Chodrow, P. S. (2017a). Divergence, entropy, information: An opinionated introduction to information theory. *arXiv: 1708.07459*
2016	Chodrow, P. S., Al-Awwad, Z., Jiang, S., and González, M. C. (2016). Demand and congestion in multiplex transportation networks. *PloS one*, 11(9):e0161738
2013	Chodrow, P., Franks, C., and Lins, B. (2013). Upper and lower bounds for the iterates of order-preserving homogeneous maps on cones. *Linear Algebra and its Applications*, 439(4):999–1005

Selected Talks

2019	Configuration Models of Random Hypergraphs, Northeastern University, Boston USA (Invited); NetSci 2019, Burlington, VT; SIAM Workshop on Network Science, Snowbird, UT.
2018	Equilibrium Community Structure in Binary-State Adaptive Voter Models. SIAM Workshop on Network Science, Portland, Oregon; Conference on Complex Networks (CompleNet), Northeastern University, Boston
	What's the Fuss about Power Laws? ORC Student Seminar, MIT, Cambridge, USA.
2017	The Structure of Spatial Segregation. Growth Lab Seminar, Harvard Kennedy School, Cambridge, USA.
	Information-Geometric Methods for Coarse-Graining Annotated Spatial Networks, NetSci 2017, Indianapolis, IN.
2016	An Information Theoretic Lens on Urban Diversity. Conference on Complex Systems, Amsterdam, The Netherlands.
	Demand and Congestion in Multiplex Transportation Networks. Conference on Complex Systems, Amsterdam, The Netherlands.
2013	Relativism, Cooperation, and the Practice of Inquiry. Conference on the Metaphysics of Culture, Helsinki, Finland.
	The Right Way to Care About the Truth. Filosofisk Supplement, the student philosophical society at the University of Oslo, Oslo, Norway.

Selected Teaching

2017-	**Curriculum-Designer and Instructor**: Introduction to Statistical Programming for Business Analytics, MIT
	Organizer: "Computing in Optimization and Statistics", MIT
	Teaching Assistant: 6.268: "Network Science and Models," 6.431: "Introduction to Probability," 1.208: "Human Mobility and Networks", MIT
2016	**Group Co-Leader**: Workshop in Predictive Policing, ICERM, Providence, RI.
	Instructor: "Data Wrangling in R" at MIT's January course "Software Tools in Statistics and Optimization."
2012	**Teaching Assistant** for an advanced undergraduate course in the philosophy of action with Professor Bjørn Ramberg at Universitet i Oslo.
2010-12	**Mathematics Academic Support** at Swarthmore College, Swarthmore PA.
2009-12	**Writing Mentor** at Swarthmore College, Swarthmore PA. Paper areas including philosophy, mathematics, English, sociology, and anthropology. Worked in-depth over a full year with two students writing senior theses.
2012	**Teaching Assistant** for intermediate-level course on the philosopy of Plato with Professor Grace Ledbetter at Swarthmore College, Swarthmore PA.

Service

2016-	**Reviewer**. *PLoS ONE*; *International Journal of Geographic Information Systems*; *Computers, Environment, and Urban Systems*.
2016-	**Program Committee Member**. NetSci-X, Conference on Complex Systems, International Conference on Complex Systems.

Research & Professional Experience

2018	**Summer School** in Economic Networks, Oxford, UK
2013-15	**Analyst**, Health Leads, Boston MA
2012-14	**Research Assistant**, Laboratory for Quantitative Medicine
2012-13	**Visiting Researcher**, Center for the Study of Mind in Nature, Oslo, Norway
2011-12	**Senior Honors Thesis** in philosophy, entitled *Perception and Moral Goodness*, Swarthmore College.
2010	**REU Fellow** in matrix analysis, College of William and Mary, Williamsburg VA.
2009	**Research Assistant** in theoretical plasma physics, James Madison University, Harrisonburg VA.

Community Service

2017 -	**Instructor**, Harvard Aikikai, Cambridge MA
2017 -	**Board Member**, Aikido Tekkojuku of Boston, Somerville MA
2015 - 2016	**Analytics Consultant**, Health Leads, Boston MA
2014	**Analytics Consultant**, Tech Networks of Boston Pro Bono Consulting
2010-12	**Cofounder and Director**, NinjaGram Charities, Swarthmore College, Swarthmore MA
2011-12	**Assistant Children's Instructor**, Aikido Kokikai of Swarthmore, Swarthmore PA
2008-12	**Cofounder and Director**, Swarthmore Martial Arts Club, Swarthmore PA

Other

Languages: English (native), German (reading and listening), Norwegian Bokmal (reading)
Software: R, Python, LaTeX, Linux
Activities: Aikido: *1st dan (Aikikai).* Chess: *Virginia State High School Champion (2008)*

Other Activities

Aikido (Aikikai). Current rank: 1st Dan.
Taekwondo (ITF). Current rank: 1st Dan.
Chess. Current Elo: 1937.

Last updated: June 13, 2019