

AARON L BRAMSON

aaronbramson@gmail.com • USA: 734-730-0031 • JPN: 080-8823-8539

ACADEMIC AFFILIATIONS

- Research Scientist** April 2014 to present
Lab for Symbolic Cognitive Development, Riken Brain Science Institute, Japan
- Affiliate Researcher** September 2013 to present
Department of General Economics, Ghent University, Belgium
- Adjunct Professor** July 2016 to present
Dept of Software and Information Systems, UNC Charlotte, USA

EDUCATION

- Ph.D. Joint Degree with Political Science and Philosophy** April 2012
University of Michigan, Ann Arbor, MI
- Certificate in Complex Systems and Agent-Based Computational Models** Dec 2008
University of Michigan, Ann Arbor, MI
- M.S. in Mathematics** May 2004
Northeastern University, Boston, MA
- B.S. in Economics** Aug 1999
University of Florida, Gainesville, FL
- B.A. in Philosophy** Aug 1999
University of Florida, Gainesville, FL

EMPLOYMENT AND CONSULTING EXPERIENCE

- Research Scientist** May 2014 to present
Lab for Symbolic Cognitive Development, RIKEN Brain Science Institute, Wako, Japan
Primary scientist developing analysis algorithms for adaptive multi-sensor neuro-behavioral data streams, experiment automation, Big Data visualization, etc.
- Postdoctoral Appointee** Aug 2013 to April 2014
Systems Research, Analysis, and Applications, Sandia Labs, Albuquerque, NM
Methodological work in support of several ongoing projects: network effects in opinion dynamics, multi-model mechanism design, bounding unknown unknowns, data course-graining, and others.
- Visiting Research Professor** Oct - Nov 2012, Apr - July 2013
Economics Department, Ghent University, Belgium
Applied a variation of intertemporal networks called a “temporal web” to track risk propagation in large-scale interbank transaction data and used it to develop an agent-based model for predictive analytics of bank failure and cascading collapse.
- Research Scientist** Dec 2012 to March 2013
Lab for Symbolic Cognitive Development, Riken Brain Science Institute, Wako, Japan
Building software to implement my Revealed Dynamics Markov Modeling technique and apply it to identify patterns in fMRI data streams combined with physiological data.
- Consultant on Complexity in Public Policy** September 2012
Civil Service College and Various Government Agencies, Singapore
Engaged with multiple political organizations to advise on incorporating and harnessing complexity. Taught three workshops and connected local complexity-related academics with interested parties.

Human Body Function for Intensive Care Unit Interventions Feb 2012 to August 2012
Mayo Clinic, Rochester, MN

Initial development of an integrated mesoscopic human body simulator to uncover knowledge gaps in function and response to intensive care interventions.

Modeling Information Transfer across Social Networks July 2009 to September 2010
Digital Consulting Service, Newbury Park, CA

Created a simulation environment for the United States Military Academy at West Point for message signaling across heterogeneous social networks with various communication properties.

Software Engineer May 2007 to August 2010
Lockheed Martin Corporation, San Diego, CA

Developed multi-int fusion methodologies for urban operations program and participated in technology development for R&D and new contract proposals for cultural fusion, social network analysis, and incorporating complex systems methods. Top Secret security clearance issued.

TEACHING EXPERIENCE

CSI-ABM Summer School: Agent-based Modeling in Economics June 2014
Ghent University, Ghent, Belgium

Instructor for intensive workshop at Ghent University in agent-based modeling with focus on model design, analysis, and ABM best practices.

NEH Institute for Advanced Topics in the Digital Humanities June 2011
University of North Carolina, Charlotte, NC

Instructor and mentor for intensive month-long workshop at UNC Charlotte covering agent-based models, networks, and simulation analysis aimed at humanities graduate students.

Post-Doctoral Research Fellow February 2010 to July 2011
Rotman School, University of Toronto, Toronto, ON

Worked with Dr. Mike Ryall to develop and co-teach the “Integrated Thinking Practicum” course for first-year MBA students that includes causal models (Bayesian networks), agent-based models, statistical forecasting, and game theory.

Teaching Assistant September 2009 to December 2009
University of Michigan, Ann Arbor, MI

Assistant and discussion session instructor for Scott Page’s undergraduate course Applied Complex Systems: Emergent Challenges.

ICPSR Instructor July-August 2005, 2006, 2007, 2008, and 2009
University of Michigan, Ann Arbor, MI

Developed and taught a four-week workshop on building computational models for complex systems for the Inter-university Consortium for Political and Social Research (ICPSR) Summer Program as part of Scott Page and Ken Kollman’s *Complex Systems Models in the Social Sciences* course.

Graduate Teaching Assistant January 2006 to May 2006
University of Michigan, Ann Arbor, MI

Assistant for Mark Newman’s graduate level *Theory of Complex Systems* course. Content required a strong capability in mathematical and computational methods (especially complex networks).

Graduate Teaching Assistant September 2002 to May 2004
Northeastern University, Boston, MA

Instructor for *College Algebra*, *Calculus 3 for Biological Sciences* (twice), and *Foundations of Mathematics*. The foundations course offered me the rare opportunity as a graduate student to develop and teach my own course in mathematical logic to a general (non-major) student body.

SELECTED PUBLICATIONS

Aaron Bramson, Patrick Grim, Daniel J. Singer, William J. Berger, Graham Sack, Steven Fisher, and Carissa Flocken. “Understanding Polarization: Meanings, Measures, and Model Evaluation” *Philosophy of Science* Volume 84, Issue 1 (2017).

Aaron Bramson and Benjamin Vandermarliere. “Benchmarking Measures of Network Influence” *Scientific Reports* 6, 34052; (2016).

Aaron Bramson, Patrick Grim, Daniel J. Singer, Steven Fisher, William Berger, Graham Sack, and Carissa Flocken. “Disambiguation of Social Polarization Concepts and Measures” *Mathematical Sociology* Volume 40, Issue 2, pp. 80-111 (2016).

Aaron Bramson and Benjamin Vandermarliere. “Dynamical Properties of Interaction Data” *Journal of Complex Networks* Volume 4, Issue 1, pp. 87-114 (2015).

Jiin Jung and Aaron Bramson. “An Agent Based Model of Indirect Minority Influence on Social Change” *Proceedings of the 14th International Conference on the Synthesis and Simulation of Living Systems*, eds. H. Sayama, et al. MIT Press pp. 400-407 (2014).

M. D. Ryall and A. L. Bramson. *Influence and Intervention: Causal Modeling for Business Analysis*. Routledge Press (October, 2013).

Patrick Grim, Daniel J. Singer, Steven Fisher, Aaron Bramson, William J. Berger, Christopher Reade, Carissa Flocken, and Adam Sales. “Scientific Networks on Data Landscapes: Question Difficulty, Epistemic Success, and Convergence” *Episteme* Volume 10, 4 (October 2013).

Jenna Bednar, Aaron Bramson, Andrea Jones-Rooy, and Scott Page. “Emergent cultural signatures and persistent diversity” *Rationality and Society*, Volume 22(4). (November 2010).

Aaron Bramson. “Evolution of Cooperation and Coordination via Preferential Detachment” *Proceedings of the IEEE TIC-STH Symposium on Complex Systems*. (September 2009).

Jenna Bednar, Aaron Bramson, Andrea Jones-Rooy, and Scott Page. “Conformity, consistency, and cultural heterogeneity” *Proceedings of Annual Meeting of the American Political Science Association*. (2006).

Aaron Bramson. “Methodology for Building Confidence Measures” *Proceedings of the 2004 S.P.I.E. Defense and Security Conference*. (April 2004).

PAPERS SUBMITTED OR IN REVIEW

Daniel J. Singer, Aaron Bramson, Patrick Grim, Bennett Holman, Jiin Jung, Karen Kovaka, Anika Ranginani, and William J. Berger. “The Rationality of Social and Political Polarization”

Patrick Grim, Daniel J. Singer, Aaron Bramson, and William J. Berger. “Wisdom of Crowds, Wisdom of the Few: Expertise versus Diversity across Epistemic Landscapes”

Patrick Grim, Daniel J. Singer, Aaron Bramson, William J. Berger, Jiin Jung, and Scott Page. “Votes and Talk: Sorrows and Success in Representational Hierarchy”

Jiin Jung and Aaron Bramson. “Conditions for Social Change via Indirect Minority Influence”

PAPERS IN PROGRESS

Aaron Bramson. “Quantifying Political Divisiveness: An Examination of Political Polarization in America”

Aaron Bramson. “Revealed Dynamics Markov Modeling”

Aaron Bramson. “Measuring Dynamical Uncertainty in Heterogeneous Time Series Data”

Aaron Bramson. “Unsupervised Detection of Behavioral Regimes and Phase Order Parameters”

Aaron Bramson, Kevin Hoefman, Koen Schoors, and Milan van den Heuvel. “Diplomatic Relations in a Massively Multiplayer Online Society”

Kevin Hoefman, Aaron Bramson, Koen Schoors, and Milan van den Heuvel. “Revealed Preference Functions in Massively Multiplayer Online Game Markets”

Milan van den Heuvel, Aaron Bramson, and Koen Schoors. “Endogenous Market Hub Determination in Massively Multiplayer Economies”

Koen Schoors and Aaron Bramson. “Courier Contract Market Efficiency in Massively Multiplayer Game Economies”

WORKSHOPS AND INVITED TALKS

Advancing the Analysis of Agent-Based Models September 2012
Invited Talk, Nanyang Technical University

Policy Modeling for Complex Issues September 2012
Two 2-full-day workshops for Civil Service College in Singapore

Hypergraphs and K-Partite Graphs June 2012
Invited Talk, Human Complexity Conference 2012

Agent-Based Modeling in Philosophy May 2012
5-day workshop in Spa, Belgium for Tilburg University

Network Theory and ABM Analysis April 2012
Invited Talk, BHAAAS -Technical Symposium on Complex Systems in Bosnia-Herzegovina

Measuring Dynamical Properties February 2012
Invited Talk, More is Different Conference, Nanyang Technical University

Introduction to ABM with NetLogo December 2010
2-day workshop for the Initiative in Population Research at OSU

Advancing the Analysis of Agent-Based Models September 2010
Invited Talk, UNC Forum on the Future of Complex Systems Research and Applications

Introduction to Agent-Based Modeling with Netlogo July 2009
Invited Talk, EITM Guest Lecture

Models of Science and the Role of Causation October 2008
Invited Talk, UM Philosophy Graduate Student Workshop

Introduction to Genetic Algorithms July 2007
Invited Talk, Lockheed Martin Tech Talk

PROFESSIONAL AFFILIATIONS

- Co-Founder and Chief Science Officer** October 2015 to present
Rikaenalysis K.K., Riken Venture for Research Marketization
- President and Owner** October 2008 to present
Complexity Research Corporation, Simulation and Education Consulting Services
- President and Owner** November 2006 to present
Jika-Tabi Incorporated, Footwear Design and Distribution

TECHNICAL AND SPECIALIZED SKILLS

Research Tools: Mathematica, Python, L^AT_EX, NetLogo, Java, C++
Web Tools: HTML, CSS, JavaScript (including D3.js)
Design Tools: Photoshop, Illustrator, Daz3D

LANGUAGE ABILITIES

Japanese: advanced speaking, beginner reading and writing; basic Spanish and German.

MORE INFORMATION

For more details on research, to find research papers, and to download presentation materials visit www.bramson.net and www.complexityblog.com