Aaron L Bramson

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Affiliations

Visiting Scientist April 2013 to present
Lab for Symbolic Cognitive Development, RIKEN Brain Science Institute, Wako, Japan

Visiting Scientist April 2013 to present
ARI@N Energy Research Institute, Nanyang Technical University, Singapore

Education

Ph.D. Joint Degree with Political Science and Philosophy Dec 2011
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 Dec 2012 to March 2013
Lab for Symbolic Cognitive Development, RIKEN Brain Science Institute, Wako, Japan
Building and applying analysis software to implement my methods for measuring dynamical properties and identifying patterns in brain activity data streams as well as simulation output and other datasets.

Visiting Research Professor Oct 2012 to Nov 2012
Economics Department, University of Gent, Belgium
Applied an analysis technique of mine called a "temporal web" to interbank transaction data for the entire Russian banking system for a 6-year period. Also developed a generative model to understand and develop predictive analytics for bank failure and cascading collapse.

Consultant on Complexity in Public Policy September 2012
Civil Service College and Various Government Agencies, Singapore
Discussed incorporating and harnessing complexity and building appropriate models for improving national policy with several government agencies, university professors, and policy organizations in areas including: vehicle licenses, declining birth rates, traffic, urban wind power generation, technology innovation incentives, and public service logistics.

Human Body Function for Intensive Care Unit Interventions Feb 2012 to August 2012
Mayo Clinic, Rochester, MN
Planned and initiated development of a tissue-level agent-based model of human anatomy and physiology to uncover knowledge gaps in function and response to intensive care interventions.

Post-Doctoral Research Fellow February 2010 to July 2011
Rotman School, University of Toronto, Toronto, ON
Worked with Dr. Mike Ryall to develop a modeling course for first-year MBA students that includes causal (Bayesian networks), agent-based, statistical, and integrated models. Our course materials are being published as a textbook for causal modeling for business analysis.

Modeling Information Transfer across Social Networks July 2009 to September 2010

Digital Consulting Service, Newbury Park, CA

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

Metrics and Measures Development, Multi-Int Fusion 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.

Network Analysis and Software Development September 2006 to April 2007

Research Foundation at CUNY, New York, NY

Built 3D network visualization and analysis toolkit for global terrorist activity research as an independent contractor.

Summer Research Assistant June 2003 to August 2003

Air Force Research Laboratory (AFRL), Rome, NY

Developed methods to measure relationship confidence in a high-level fusion project then under development. Produced technical paper presented at S.P.I.E. 2004 (see below).

Instructor Experience

NEH Institute for Advanced Topics in the Digital Humanities June 2011

University of North Carolina, Charlotte, NC

Mentor for 3-week workshop at UNC Charlotte to add simulation techniques to the repertoire of methods already employed by humanists. Included teaching technique, coordinating and evaluating participants' projects, and planning future development.

Modeling and Strategy Course Development August 2009 to January 2010

University of Toronto, Toronto, ON

Developing course material and educational models for an MBA core course. Models include decision problems, game theory, agent-based modeling, and evolutionary programming.

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 in Quantitative Methods.

Computational Modeling Workshop Instructor January 2007 to March 2007

Oberlin College, Oberlin, OH

Presented a series of talks and helped students develop agent-based computational models for Richard Salter's computational modeling 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 firm capability in mathematical and computational methods (including 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.

Publications

M. D. Ryall and A. L. Bramson. *Influence and Intervention: Causal Modeling for Business Analysis*. Routledge Press (forthcoming August 27, 2013).

Patrick Grim, Aaron Bramson, Daniel J. Singer, Steven Fisher, Carissa Flocken, and William Berger. "Philosophical Analysis in Modeling Polarization: Notes from a Work in Progress" *APA Newsletter on Philosophy and Computers*, Vol. 12, No. 1. (Fall 2012).

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. "Formal Measures of Dynamical Properties: Robustness" *Symposia Technical Report Series of the AAAI.* (November 2010).

Aaron Bramson. "Formal Measures of Dynamical Properties: Tipping Points" *Symposia Technical Report Series of the AAAI.* (November 2009).

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

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

Technical and Specialized Skills

Research Tools: Java, Mathematica, NetLogo, LaTeX, Python, R
Design Tools: HTML, CSS, JavaScript, Photoshop, Illustrator

Language Abilities

Advanced Japanese, 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`

Selected Presentations, Workshops, and Invited Talks

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

Workshop: 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
Human Complexity 2012

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

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

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

Workshop: Agent-Based Modeling and Data Analysis — June 2011
3-week Institute for Advanced Topics in the Digital Humanities

Workshop: Introduction to ABM with NetLogo — December 2010
OSU Invited 2-way workshop for the Initiative in Population Research

Formal Measures of Dynamical Properties: Robustness and Sustainability — November 2010
AAAI Fall Symposium: CAS in the Natural and Social Sciences

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

Analyzing Dynamics with a Trans-Temporal Network Representation — June 2010
Swarmfest 2010

Formal Measures of Dynamical Properties: Tipping Points — November 2009
AAAI Fall Symposium: CAS in the Natural and Social Sciences

Analyzing Dynamics with a Trans-Temporal Network Representation — October 2009
NAACSOS 2009

Measures of Tipping Points, Robustness, and Path Dependence — October 2009
Army Conference 2009

Evolution of Cooperation and Coordination via Preferential Detachment — September 2009
2009 IEEE Toronto International Conference

Introduction to Agent-Based Modeling with Netlogo — July 2009
EITM Guest Lecture

Models of Science and the Role of Causation — October 2008
UM Philosophy Graduate Student Workshop

Introduction to Genetic Algorithms — July 2007
Lockheed Martin Tech Talk