

Joanna J. Bryson

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Full academic CV (27 pages)
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Expertise, Interests, and Aims

I am an academic expert in intelligence, from the perspectives of computer science, psychology, and biology. I also have seven years' industrial experience in finance, entertainment, consulting, and manufacturing. Since 2005 I have studied the fundamental (evolutionary) dynamics of social intelligence, dominance structures, and collective behaviour. Since 2010 I have been engaged in technology policy for robotics, and artificially intelligent systems more generally. I am currently a fellow at Princeton's [Center for Information Technology Policy](#).

Management: At Bath I lead an [academic research group](#) of about 30, and direct as PI a [research team](#) of 8–15 students and postdocs. In industry I have been the technical project lead on three large projects: automating open-auction trading floor support (1 & 5 developers, both succeeded), and reengineering a manufacturer's product and sales IT system (dozens of developers, failed.) I have been the reviewer for several multi-million euro EU robotics and AI projects. Until moving to Princeton, I was a member of Bath University's Senate, Council, and Court—elected multiple times to represent the academic assembly.

Social Media: My primary public presence is on [twitter \(j2bryson\)](#), [the Web](#), and [Blogger](#). Additional presences on facebook, linkedin, tumblr, Google+.

I am interested in challenging work where my expertise can make a constructive difference, whether through governance, the economy or extending human knowledge.

Employment

DEPARTMENT OF COMPUTER SCIENCE University of Bath, England
READER (*US: Assoc. Prof. with tenure*) September 2010 – *present*;
LECTURER B (*US: Assist. Prof. with tenure*) October 2002 – August 2010

PRIMATE COGNITIVE NEUROSCIENCE LABORATORY Harvard University, Cambridge USA
Postdoctoral Fellow with Prof. Marc D. Hauser, modeling specialized learning in primates.
October 2001 – Sept 2002

HUMAN COMMUNICATION RESEARCH CENTER University of Edinburgh, Scotland
Research Assistant to Prof. Johanna Moore and Prof. Mark Steedman; reactive and situated planning for natural language dialog systems, with application to tutoring. Jan 1999 – March 2000

LEGO Boston, MA and Billund, Denmark
Consultation and research for the toy company, known for constructive and educational play.
April 1995 – December 1995, February 1998 – December 1998

MARBLE ASSOCIATES, INC. Waltham, MA, USA
Senior Associate for a technology consulting agency. Primary assignment was a large-scale re-engineering effort for a technology manufacturer with 30,000 employees worldwide. Initially positioned in the “Core Object Support” team; after three months, made Technical Project Lead. Also assisted with Marble's business development. January 1993 – August 1993, Summer 1994

LAWRENCE I. SCHULMAN & CO., A M INVESTORS Chicago, IL, USA
Every aspect of technology development and support for two open-outcry trading companies. For each, was Project Leader for real-time automation of core support process to the floor traders, which required software and training for 10–20 clerical staff. Both projects successful, and the delivered code used into the twenty-first century, including by subsequent startups.
July 1986 – September 1988, September 1988 – July 1991

Education

PH.D. IN COMPUTER SCIENCE June 2001
THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Dissertation Title: Intelligence by Design: Principles of Modularity and Coordination for Engineering Complex Adaptive Agents

Thesis Committee: Lynn Andrea Stein (advisor), Bruce Blumberg, Olin Shivers, Gill Pratt.

Courses Include: Principles of Computing Systems, Embodiment and Cognition,
Computer Architecture, Artificial Intelligence, Theory of Computation

M. PHIL. IN PSYCHOLOGY January 2000
THE UNIVERSITY OF EDINBURGH

Dissertation Title: The Study of Sequential and Hierarchical Organization of Behavior
via Artificial Mechanisms of Action Selection

M. SC. IN ARTIFICIAL INTELLIGENCE November 1992
THE UNIVERSITY OF EDINBURGH

Dissertation Title: The Subsumption Strategy Development of a Music Modelling System

Courses Include: Knowledge Representation and Inference, Intelligent Sensing and
Control, Neural Networks, Software for Parallel Architectures, Expert Systems

B. A. IN BEHAVIORAL SCIENCE June 1986
THE COLLEGE OF THE UNIVERSITY OF CHICAGO

Courses Include: Human Information Processing, Perception, Human Interaction,
Developmental Neuropsychology, Ethology

Visiting Academic Positions

CENTER FOR INFORMATION TECHNOLOGY POLICY (CITP) Princeton University
Visiting Fellow. Topic: “Public Goods and Artificial Intelligence.” Aug 2015–Jul 2016

MANNHEIMER ZENTRUM FÜR EUROPÄISCHE SOZIALFORSCHUNG University Mannheim
Visiting Research Fellow. The German center of excellence for Social Science. Jan 2011–Jan 2014

DEPARTMENT OF ANTHROPOLOGY Oxford University
Visiting Research Fellow, Harvey Whitehouse (PI), “Explaining Religion.” Feb 2010–Dec 2010

THE KONRAD LORENZ INSTITUTE FOR EVOLUTION AND COGNITION RESEARCH Vienna
Resident Faculty and Hans Przibram Fellow (sabbatical). Topic: “Factors Limiting the Biological
Evolution of Cultural Evolution.” Aug 2007–Aug 2009

Professional Activities

Associate Editor for *Adaptive Behavior* (2002–present); editorial board for *AI & Society* (2013–
present), *The Int. J. of Synthetic Emotions* (2008–present), *J. of Mind Theory* (2008–present).
Reviews for many other biology, anthropology, AI and Cognitive Science journals and con-
ferences.

Member of the UK’s Engineering and Physical Sciences Research Council (EPSRC) College.
(2006–present). Project reviews and proposal evaluations for the European Commission
(2005–2010). Reviews for many other international grant agencies.

99 peer-reviewed publications (journal, book archival conference), 57 other peer-reviewed con-
ference presentations, 124 invited academic talks in 13 countries and 3 continents, frequent
public talks and media interviews.

Representative Recent Publications

Dominic Mitchell, Joanna J. Bryson, Paul Rauwolf, and Gordon P. D. Ingram, “On the reliabil-
ity of unreliable information: Gossip as cultural memory”, *Interaction Studies*, accepted for
publication.

Bidan Huang, Miao Li, Ravin Luis De Souza, Joanna J. Bryson, and Aude Billard, “A modu-
lar approach to learning manipulation strategies from human demonstration”, *Autonomous
Robots*, 25 pages, in press / online first since 5 October 2015.

Joanna J. Bryson, “Artificial Intelligence and Pro-Social Behaviour”, *Collective Agency and Co-
operation in Natural and Artificial Systems*, Catrin Misselhorn (ed.), pp. 281–306, Springer,
2015.

Yifei Wang, Yinghong Lan, Daniel M. Weinreich, Nicholas K. Priest and Joanna J. Bryson, “Re-
combination Facilitates Fitness Optimisation Despite Substantial Fitness Costs in the Evolu-
tion of Artificial Gene Regulatory Network”, *European Conference on Artificial Life*, York,
July 2015.

- Paul Rauwolf, Dominic Mitchell and Joanna J. Bryson, “Value Homophily Benefits Cooperation but Motivates Employing Incorrect Social Information”, *Journal of Theoretical Biology*, **367**:246–261, February 2015.
- Joanna J. Bryson, James Mitchell, Simon T. Powers and Karolina Sylwester, “Understanding and Addressing Cultural Variation in Costly Antisocial Punishment”, in *Applied Evolutionary Anthropology*, M. A. Gibson and D. W. Lawson (eds.), pp. 201–223, Springer, 2014.
- Joanna J. Bryson “The Role of Stability in Cultural Evolution: Innovation and Conformity in Implicit Knowledge Discovery”, in *Perspectives on Culture and Agent-Based Simulations*, V. Dignum and F. Dignum (eds), pp. 169–187, Springer, Berlin, 2014.
- Karolina Sylwester, Benedikt Herrmann and Joanna J. Bryson, “*Homo homini lupus?* Anti-social punishment revisited”, *J. Neuroscience, Psychology, & Economics*, **6**(3):167–188, 2013.
- Harvey Whitehouse, Ken Kahn, Michael E. Hochberg and Joanna J. Bryson, “The role for simulations in theory construction for the social sciences: Case studies concerning Divergent Modes of Religiosity”, *Religion, Brain & Behavior*, **2**(3):182–201, 2012.
- Anil K. Seth, Tony J. Prescott, Joanna J. Bryson (eds.), *Modelling Natural Action Selection*, Cambridge University Press, 2012.
- Eugene Y. Bann and Joanna J. Bryson “Measuring Cultural Relativity of Emotional Valence and Arousal using Semantic Clustering and Twitter”, *Proceedings of the Thirty-Fifth Annual Conference of the Cognitive Science Society (CogSci)*, Berlin, August 2013, pp. 1809–1815.
- Bidan Huang, Sahar El-Khoury, Miao Li, Joanna J. Bryson and Aude Billard, “Learning a Real Time Grasping Strategy”, *IEEE International Conference on Robotics and Automation (ICRA)*, Karlsruhe, Germany 6–10 May 2013.
- Joanna J. Bryson and Philip P. Kime, “Just an Artifact: Why Machines are Perceived as Moral Agents”, *The Twenty-Second International Joint Conference on Artificial Intelligence (IJCAI)*, Barcelona, Spain, pp. 1641–1646, Morgan Kaufmann, 2011.
- Joanna J. Bryson and Emmanuel A. R. Tanguy “Simplifying the Design of Human-Like Behaviour: Emotions as Durative Dynamic State for Action Selection”, *International Journal of Synthetic Emotions*, **1**(1):30–50, January 2010.
- Joanna J. Bryson “Embodiment versus Memetics”, *Mind & Society*, **7**(1):77–94, June 2008.
- Joanna J. Bryson, Yasushi Ando and Hagen Lehmann “Agent-based modelling as scientific method: a case study analysing primate social behaviour”, *Philosophical Transactions of the Royal Society, B — Biology*, **362**(1485):1685–1698, September 2007.

Representative Public Policy and Engagement

- Invited participant (selected from applicants) in the National Institute for Mathematical and Biological Synthesis (NIMBioS) Investigative Workshop on *Evolutionary approaches to the understanding of decentralized warfare*, Knoxville, Tennessee, 16–18 September 2015.
- Invited participant, *Roundtable on Ethics and Trust Issues in the Human-Machine Relationship*. Roundtable convened by the Royal Society, the Government Office for Science (GOSci), and the Arts and Humanities Research Council (AHRC). London, 23 June 2015.
- Invited participant, *European Workshop on Ethical Issues in Human-Machine-Interaction and Service Robotics*, Brussels, 6 May 2015.
- “We’re Already Succeeding (& It’s Already Scary / Wonderful)” *The Future of AI: What if We Succeed?*, plenary panel participant with H. Kautz, A. Sandberg and S. Thrun, S. Russell (chair), 23rd *International Joint Conference on Artificial Intelligence (IJCAI)*, Beijing, 9 August 2013.
- “From Artificial Consciousness to Human Public Goods: A Skeptical Review of Robot Ethics”, invited public lecture, *The Conway Hall Ethical Society*, London, 15 September 2013.
- Joanna J. Bryson, Kerstin Dautenhahn and Geoff Pegman, letter [published online by *The Economist*, 16 June 2012 issue](#), in response to their article *Man and the machine*.
- One of 14 coauthors, [The EPSRC Principles of Robotics](#), April 2011. Proposed and coauthored the first draft with Lilian Edwards, as the primary outcome for the UK’s Engineering and Physical Sciences Research Council *Robotics Retreat*, 29 September–1 October 2010.