

JEFFREY R. N. FORBES

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Teaching Interests Introductory computer science, data structures and algorithms, discrete algorithms, robotics, social network analysis, social implications of computing, and service learning.

Research Interests Computer science education, science of networks, intelligent agents, and educational technology

Education UNIVERSITY OF CALIFORNIA, BERKELEY Berkeley, California
Ph.D., Computer Science, May 2002.

Thesis title: *Reinforcement Learning for Autonomous Vehicles*
Research advisor: Prof. Stuart Russell

STANFORD UNIVERSITY Stanford, California
B.S., Computer Science, June 1993.

Professional Appointments DUKE UNIVERSITY Durham, North Carolina
Assistant Professor of the Practice of Computer Science
June 2002–Present
Lecturer of Computer Science
January 2001–May 2002

UNIVERSITY OF CALIFORNIA, BERKELEY Berkeley, California
Instructor
Summer 1998

Employment UNIVERSITY OF CALIFORNIA, BERKELEY Berkeley, California
May 1994–December 2000

Graduate Student Researcher: Investigated algorithms for intelligent agent architectures. Designed and implemented a system for learning control of various tasks. The system maintains an accurate value function estimate and exploits the structure of the task domains by using a domain model and hierarchical control. The system was the basis for my dissertation.

Led development of the Bayesian Automated Taxi project. Designed and implemented system for monitoring traffic state and making decisions. Developed traffic simulator infrastructure and controllers for autonomous vehicles. Supervised six undergraduate researchers.

June 1997–October 1997

Research Assistant: Worked on projects with the Intelligent Systems Lab. Constructed simulator and robust controllers for intelligent lane selection policies.

BELL COMMUNICATIONS RESEARCH

Piscataway, New Jersey

Summers 1990–1992

Staff Technologist: Developed software for various projects including network monitoring software databases, automatic instrument control, and CAD for VLSI.

Publications

Conference Papers

L. G. Huettel, J. Forbes, L. Franzoni, R. A. Malkin, J. Nadeau, K. Nightingale and G. A. Ybarra. Transcending the Traditional: Using Tablet PCs to Enhance Engineering and Computer Science Instruction. *Proceedings of the 37th ASEE/IEEE Frontiers in Education Conference*, IEEE Press, Milwaukee, WI, 2007.

B. Trushkowsky, K. Campbell, and J. Forbes. An Architecture for a Collaborative Bibliographic database. *Proceedings of the Richard Tapia Celebration of Diversity in Computing Conference*, Orlando, FL, 2007.

Casey Alt, Owen Astrachan, Jeffrey Forbes, Richard Lucic, and Susan Rodger, Social networks Generate Interest in Computer Science. *Proceedings of the 36th Technical Symposium on Computer Science Education*, Houston, TX, 2006.

T. Bailey and J. Forbes. Just-in-Time Teaching for CS0. *Proceedings of the 36th Technical Symposium on Computer Science Education*, St. Louis, MO, 2005.

T. Bailey and J. Forbes. Computers and Society in CS0: An Interactive Approach. *Proceedings of the 34th ASEE/IEEE Frontiers in Education Conference*, IEEE Press, Savannah, GA, p. S2F:19–23, 2004.

S. Pollard and J. Forbes. Hands-on Labs Without Computers. *Proceedings of the 34th Technical Symposium on Computer Science Education*. p. 296–300, 2003.

Owen L. Astrachan, Robert C. Duvall, Jeffrey R. N. Forbes, and Susan H. Rodger, Active Learning in Small to Large Courses, In *Proceedings of the Frontiers in Education Conference*, IEEE, 2002.

J. Forbes, T. Huang, K. Kanazawa, and S. Russell. The BATmobile: Towards a Bayesian Automated Taxi. *Proceedings of International Joint Conference on Artificial Intelligence*, 1995.

M. Wellman, C. Liu, D. Oynadath, S. Russell, J. Forbes, T. Huang, and K. Kanazawa. Decision-theoretic reasoning for traffic monitoring and vehicle control. *Proceedings of the Intelligent Vehicles '95 Symposium*, 1995.

Conference Posters

B. Trushkowsky, D. Stecher, and J. Forbes. CoBib: Collaborative indexing and annotation of bibliographic citations. *ACM 2008 Conference on Computer Supported Collaborative Work*, San Diego, CA, November 2008.

J. Forbes, Social Networks as an Introductions to Computer Science. *Sunbelt XXVIII International Sunbelt Social Network Conference*, St. Petersburg, FL, January 2008.

Other Conference Sessions

J. Forbes and D. Garcia, ...But What Do the Top-Rated Schools Do? A Survey of Introductory Computer Science Curricula. (*Special Session*) *Proceedings of the 38th Technical Symposium on Computer Science Education*, 2007.

J. Forbes and O. Astrachan, HarambeNet: Introducing Computer Science through the Modeling and Analysis of Social Networks. (*Workshop*) *Proceedings of the 38th Technical Symposium on Computer Science Education*, 2007.

O. Astrachan and J. Forbes, Innovative Approaches to Broadening Computer Science, (*Birds-of-a-Feather*) *ACM Technical Symposium on Computer Science Education*, Houston, TX, March 2, 2006.

D. Cliburn and J. Forbes, Preparing for a Career as an Educator in Academia, (*Birds-of-a-Feather*) *ACM Technical Symposium on Computer Science Education*, Norfolk, VA, March 4, 2004.

Workshop Papers

J. Forbes and J. Gilbert, Building the future black faculty pipeline. *Proceedings of AfroGeeks: From technophobia to technophilia*. Center for Black Studies, University of California, Santa Barbara. 2004.

J. Forbes and D. Andre, Representations for Learning Control Policies. *ICML Workshop on Development of Representations*. 2002.

J. Forbes and D. Andre. Real-time reinforcement learning in continuous domains. *AAAI Spring Symposium on Real-Time Autonomous Systems*. 2000.

Magazine Articles:

P. E. Rybski, J. Forbes, B. Avanzato, D. Burhans, Z. Dodds, P. Oh and M. Scheutz, The AAI-2006 Mobile Robot Competition and Exhibition, *AI Magazine*, 28(1), Spring 2007.

Technical Reports:

J. R. N. Forbes, *Reinforcement Learning for Autonomous Vehicles*, Ph.D. Thesis, Computer Science Division, University of California at Berkeley, March 2002.

J. Forbes and D. Andre. Practical reinforcement learning in continuous domains. Technical report UCB/CSD-00-1109, Computer Science Division, University of California, Berkeley, 2000.

J. Forbes, N. Oza, R. Parr, and S. Russell. Feasibility Study of Fully Automated Vehicles Using Decision-Theoretic Control. Technical Report UCB-ITS-PRR-97-18, PATH/UC Berkeley, 1997.

**Invited
Talks**

“Modeling and Analysis of Social Networks,” Twelfth Conference for African-American Researchers in the Mathematical Sciences, Chapel Hill, NC, June 22, 2006.

“Moving Toward Future Objectives,” Student and Scholarship Recipient Orientation Invited Talk, Richard Tapia Celebration of Diversity in Computing Conference. Albuquerque, NM. October 19, 2005.

“Becoming a Faculty Member,” Workshop at the BDPA National Convention, Dallas, TX, August 5, 2004.

“Becoming a Faculty Member,” Workshop at the NSBE National Convention, Anaheim, CA, March 22, 2003.

“Tutorial on Algorithmic Design,” Seventh Conference for African-American Researchers in the Mathematical Sciences, Durham, NC, June 21, 2001.

“The Science Fair: Mentoring and fostering interest in science for under-represented students,” Conference on K-12 Outreach from University Science Departments, Pittsboro, NC, February 8, 2001.

**Department
Service**

Computer Science Undergraduate Research Fellows committee, Fall 2007–Present.
Graduate Recruiting committee, Fall 2006–Present.
Undergraduate Majors Advising, Fall 2001–Present.
Undergraduate Curriculum committee, 2003 – present.

**University
Service**

Member, University Judicial Board, Jan. 2009–Present.
Advisor, OLPC @ Duke student group, Aug. 2008–Present.
Advisor, National Society of Black Engineers student group, Aug. 2003–Present.
Member, Campus Culture Initiative Steering Committee, April 2006–February 2007.
Member, Mellon Campus Life & Learning Advisory Committee, 2004–2007.
Chair, Interactive Computer Classroom Scheduling committee, 2005–2006.
Pre-Major Advisor, Aug. 2002–May 2008.
Member, Reginaldo Howard Memorial Scholarship Advisory Committee, 2002–2006.
Member, Morehouse/Spelman Science Recruiting Steering Committee, 2005–2006.
Speaker, Duke Pre-Application Visit Day, 2004, 2006, 2008.
Panelist, Office of Graduate Student Affairs, Pre-application Visitation, 2004.

**Professional
Service**

Chair, Student Robotics Competition & Member, Organizing Committee, 2009 Richard Tapia Celebration of Diversity in Computing Conference.
Co-Chair, Panels & Special Sessions, SIGCSE 2009.
Co-Chair, Student Volunteers & Activities, SIGCSE 2008.

Organizing Committee, Using AI to motivate greater participation in Computer Science, AAI Spring Symposium 2008.
Chair, Student Robotics Competition & Member, Organizing Committee, 2007 Richard Tapia Celebration of Diversity in Computing Conference.
Co-Chair, Robot Program & Conference Committee Member, AAI-2006 & AAI-2007.
Reviewer, ACM SIGCSE Conference 2003–2007.
Reviewer, NSF DUE CCLI Program, 2003, 2005–2007.
Reviewer, NSF REU Sites Program, 2003, 2007.
Chair, Mobile Robot Workshop, AAI-2005.
Reviewer, ACM Journal on Educational Resources in Computing, 2005.
Chair, Birds of a Feather Committee, 2003 Richard Tapia Celebration of Diversity in Computing Conference, 2003.

**External
Grants**

RoboCupJunior: Exhibitions of Problem Solving, Teamwork, and Creativity, Burroughs-Wellcome Fund Student Science Enrichment Program, 2/1/2008 – 1/31/2011, \$180,000.

Collaborative Research: BPC-A: ARTSI: Advancing Robotics Technology for Societal Impact, National Science Foundation CISE CNS-0742082, 9/15/2007-8/31/2009, \$71,078. Co-PI on multi-institution project led by Andrew Williams of Spelman College.

CPATH CB: Building Community via the Science of Networks, National Science Foundation CISE CNS-0722288, 8/1/2007-7/31/2009, Co-PI: Susan Rodger, \$318,360.

AAAI-07 Mobile Robot Competition and Exhibition, National Science Foundation, NSF CISE IIS-0737772, 7/1/2007-6/30/2008, \$24,032. .

CoBib: Collaborative indexing and annotation of bibliographic databases. Advisor for Katherine Trushkowsky and Kamaria Campbell. CRA Collaborative Research Experiences for Undergraduates. 11/7/2005-5/31/2007, \$9,000.

RoboCupJunior: Exhibitions of Problem Solving, Teamwork, and Creativity, Burroughs-Wellcome Fund Student Science Enrichment Program, 2/1/2005 – 1/31/2008, \$179,978.

**Internal
Grants**

Pratt Tablet PC Project, Center for Instructional Technology Faculty Fellowship, 2006-2007 \$2,575.

DukeScrobber, Center for Instruction Technology Jump Start Grant, Co-PIs: Owen Astrachan, Robert Duvall, Richard Lucic, and Susan Rodger, \$1,000.

Speaker Support, Center for Instruction Technology Jump Start Grant, \$1,000.
Programming with Robots, Duke Research Service-Learning Faculty New Course Development Grant, 6/1/2004 – 5/31/2007, \$5,000.

Modules for Great Ideas in Computer Science, Duke Center for Instructional Technology Fellowship, 2002-2003 \$2,500.

Teaching	<i>Courses Taught</i>			Enrollment	
	Date	Number	Title		
	2008	Spring	CPS 1	Principles of Computer Science	59
		Spring	CPS 100E	Program Design & Analysis II	28
	2007	Fall	CPS 96S	Teaching with Robotics	15
		Fall	CPS 100	Program Design & Analysis II	26
		Fall	CPS 100E	Program Design & Analysis II	40
		Spring	CPS 1	Principles of Computer Science	50
		Spring	CPS 82S/182S	Technical & Social Analysis of Information & the Internet	17
		Spring	CPS 189S	Computer Science Education Seminar	5
	2006	Fall	CPS 1	Principles of Computer Science	50
		Fall	CPS 97S	Minds & Computers	9
		Fall	CPS 189S	Computer Science Education Seminar	4
		Spring	CPS 1	Principles of Computer Science	65
		Spring	CPS 102	Discrete Mathematics	9
	2005	Fall	CPS 1	Principles of Computer Science	63
		Fall	CPS 97S	Minds & Computers & Robotics	13
		Spring	CPS 100	Program Design & Analysis II	36
		Spring	CPS 102	Discrete Mathematics	17
	2004	Fall	CPS 4.2	Programming with Robots	10
		Fall	CPS 6.1	Program Design & Analysis I	16
		Spring	CPS 1	Principles of Computer Science	66
		Spring	CPS 100.2	Program Design & Analysis II	20
	2003	Fall	CPS 100	Program Design & Analysis II	46
		Fall	CPS 182S.2	Technical & Social Analysis of Information & the Internet	9
		Spring	CPS 1	Principles of Computer Science	63
		Spring	CPS 6	Program Design and Analysis I	34
	2002	Fall	CPS 196.2	Robotics	10
		Fall	CPS 1	Great Ideas in Computer Science	97
		Spring	CPS 1	Computer Science Fundamentals	52
		Spring	CPS 6	Program Design and Analysis I	73
	2001	Fall	CPS 100	Program Design and Analysis II	69
		Fall	CPS 1	Computer Science Fundamentals	129
		Spring	CPS 1	Computer Science Fundamentals	123
		Spring	CPS 100	Program Design and Analysis II	91

Teaching evaluations available upon request.

Undergraduate Thesis Supervision

Dave Stecher, Recommender systems, expected graduation May 2010.

Alex Keybl, Pedagogical Software Development for OLPC, expected graduation May 2009.

Perry Nelson, Pedagogical Software Development for OLPC, expected graduation May 2009.

John Peña, Pedagogical Software Development for OLPC, expected graduation May 2009.

Beth Trushkowsky, Collaborative Indexing and Annotation of Bibliographic Citations, High Distinction, May 2007.

Undergraduate Research Projects

Andrew Bachmann, Lasun Oladeji, Brook Osborne, Preston Porter, Lee Strasburger, Terence Verla, and Nina Wickramaratne, Developing materials for Robotics Mentoring Program, Spring 2008.

Samantha Jones, Surveying Practices in Computer Science Education, Spring 2007-Spring 2008.

Dametrious Peyton, Topics in Social Networking, Fall 2007.

Anthony Bishopric, Applications of Service Oriented Architecture in Bioinformatics, Spring 2007.

Beth Trushkowsky, Collaborative Indexing and Annotation of Bibliographic Citations, Spring 2006-Summer 2007.

Chin Chun Ooi, Cognitive Robotics, Fall 2006.

Ben Spain & Dametrious Peyton, HarambeeNet, Summer 2006.

Brandon Johnson & Nii Ampa-Sowa, Software for Intelligent Robots, Spring 2006.

Owen Donovan, Robot Software Architecture, Spring 2005.

Will Palmeri, Tools for Teaching using Cocoa, Spring 2004.

Michael Ehrenfried, Developing high-level actions for the Robocup Soccer Simulator, Fall 2003 – Spring 2004.

Evan Ettinger, Modeling opponents behavior in Poker, Fall 2003 – Spring 2004.

Wai-Ping Chim, Evaluation and Assessment of CPS 1, Summer 2004.

Zhiyi Wu, Educational Robotics Course Infrastructure Development, Summer 2004.

Carolina Astigarraga, Learning with LEGOs: A study on the effectiveness of using LEGO Robotics for teaching math and science, Fall 2004.

Honors & Awards

Nominee, Mentor of the Year, Julian Abele Awards, 2007

Nominee, Excellence in Academic Advising Award, 2008

National Defense Science and Engineering Graduate Fellow

University of California Graduate Opportunity Fellow

California Legislative Grant Recipient

Stanford University Scholar Athlete

Bellcore Engineering Scholar

National Achievement Scholar

Garden State Scholar

Teagle Foundation Scholar

Associations

Association for Computing Machinery

IEEE Computer Society

Coalition to Diversify Computing

American Association for Artificial Intelligence

National Society of Black Engineers

Work Status

U.S. Citizen

References

Owen Astrachan, Professor of the Practice, Department of Computer Science, Duke University. Box 90129, Durham, NC 27708. (919) 660-6522.
ola@cs.duke.edu.

Michael Clancy, Senior Lecturer, Computer Science Division, University of California, Berkeley. 779 Soda Hall, Berkeley, CA 94720-1776. (510) 642-7017.
clancy@cs.berkeley.edu.

Zachary Dodds, Associate Professor, Computer Science Department, Harvey Mudd College. 301 Platt Boulevard, Claremont, CA 91711. (909) 607-1813.
dodds@cs.hmc.edu.

Mark Guzdial, Professor, College of Computing, Georgia Institute of Technology. 801 Atlantic Drive, Atlanta, GA, 30332-0280. (404) 894-5618.
guzdial@cc.gatech.edu.