Jeffrey R.N. Forbes

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Research Interests

Computer science education, machine learning, and learning analytics

Education

Ph.D. Computer Science, University of California, Berkeley, 2002.
Thesis title: *Reinforcement Learning for Autonomous Vehicles*
Advisor: Prof. Stuart Russell

B.S. Computer Science, Stanford University, 1993.

Employment

Computing Research Association

Director of Strategic Initiatives and Partnerships, August 2025–Present.

National Science Foundation

Lead Program Director, Computing Education and Workforce, August 2019–June 2025.

Expert, May 2016–August 2019.

Program Director, Computing Education and Workforce, May 2011–August 2014.

Georgia Institute of Technology

Director of Research & Policy, Constellations Center for Equity in Computing, June 2020–August 2021.

Duke University

Associate Professor of the Practice of Computer Science, July 2010–June 2020.

Director, Trinity College Office of Course & Curriculum Development, August 2015–June 2017.

Associate Dean of Trinity College of Arts & Sciences, August 2014–June 2017.

Assistant Professor of the Practice of Computer Science, June 2002–June 2010

Lecturer of Computer Science, January 2001–May 2002

Refereed Publications

Conference Papers

A. Smith, Kristy Boyer, J. Forbes, S. Heckman and K. Mayer-Patel, My Digital Hand: A Tool For Managing One-On-One Peer Teaching In Large Introductory Programming Courses, *Proceedings of the 48th Technical Symposium on Computer Science Education*, Seattle, WA, 2017.

M. Vellukunnel, P. Buffum, K. Boyer, J. Forbes, S. Heckman and K. Mayer-Patel, Deconstructing the Discussion Board: Student Questions and Computer Science Learning, *Proceedings of the 48th Technical Symposium on Computer Science Education*, Seattle, WA, 2017.

R. B. Osborne, T. Thomas, and J. Forbes, Teaching with Robots: A Service-Learning Approach to Mentor Training, *Proceedings of the 41st Technical Symposium on Computer Science Education*, Milwaukee, WI, 2010.

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.

C. Alt, O. Astrachan, J. Forbes, R. Lucic, and S. 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.

O. L. Astrachan, R. C. Duvall, J. R. N. Forbes, and S. 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.

Workshop Papers

R. B. Osborne, T. Thomas, and J. Forbes. RoboCupJunior Primer: Expanding Educational Robotics. *Proceedings of the 2010 AAAI Spring Symposium: Using Electronic Tangibles to Promote Learning: Design and Evaluation*, March 2010.

Williams, A.B., Touretzky, D.S., Manning, L. Walker, J.J., Boonthum, C., Forbes, J., and Doswell, J.T. The ARTSI Alliance: Recruiting underrepresented students to computer science and robotics to improve society. In *Proceedings of the 2008 AAAI Spring Symposium: Using AI to Motivate Greater Participation in Computer Science*, 110-111. AAAI Press

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.

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. Song, J. Forbes, L. Lyon, L. Maxwell, and C. Tucker, Community College Transfer Pathways. (*Panel*) SIGCSE 2019, Minneapolis, MN, 2019.

M. Cetinkaya-Rundel, A. Danyluk, J. Forbes, and M. Posner. Building Bridges for Data Science Education. (*Birds of a Feather*) SIGCSE 2019, Minneapolis, MN, 2019.

S. Westbrook, V. Piotrowski, J. Forbes, H. Taylor, and M. McClure. Understanding NSF Funding Opportunities. (*Special Session*) SIGCSE 2012, Raleigh, NC, March, 2012.

C. Lewis, L. Aaronson, E. Allatta, Z. Dodds, J. Forbes, K. McMullen, and M.Sahami, Five Slides About: Abstraction, Arrays, Uncomputability, Networks, Digital Portfolios, and CS Principles Explore Performance Task (*Special Session*). To appear in *Proceedings of the 49th Technical Symposium on Computer Science Education*, Baltimore, MD, 2018.

J. Forbes, D. Malan, H. Pon-Barry, S. Reges, and M. Sahami, Scaling Introductory Courses Using Undergraduate Teaching Assistants (*Panel*) *Proceedings of the 48th Technical Symposium on Computer Science Education*, Seattle, WA, 2017.

J.Prey, V. Barr, J. Cuny, and J. Forbes. Understanding NSF Funding Opportunities. (Special Session) SIGCSE 2014, Atlanta, GA, March, 2014.

J.Forbes, V. Piotrowski, S. Westbrook, and J. Prey. Understanding NSF Funding Opportunities. (Special Session) SIGCSE 2013, Denver, CO, March, 2013.

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.

Unrefereed Publications

Book Chapters

J. Forbes. Foreword. In *Moving Students of Color from Consumers to Producers of Technology*, Y. Rankin and J. Thomas, Eds. IGI Global, 2017.

Magazine Articles

J. Forbes, A. Kennedy, M. Martonosi, and F. Pembleton. Expanding the Pipeline: Roadmap of CISE's Efforts to Broaden Participation in Computing Through the Years, Computing Research News, February 2023, Vol. 35 No.2.

L. Lyon and J. Forbes, Lighting the Path: From Community College to Computing Careers. ACM Education Policy Committee. ACM. 2018.

S. Cooper, J. Forbes, A. Fox, S. Hambrusch, A. Ko and B. Simon. The Importance of Computing Education Research: A white paper prepared for the Computing Community Consortium committee of the Computing Research Association, January 14, 2016.

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

Technical Reports

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.

Grants

External Grants

FLIP Alliance support of (1) FLIP Dissertation Grant and (2) FLIP Academic Launch Grant, 11/6/2019-11/5/2020, Google, Co-PI with Valerie Taylor, University of Chicago and Charles Isbell, Georgia Tech. $150,000.

INCLUDES DDLP: Diversifying Future Leadership in the Professoriate in Computing at Research Universities, National Science Foundation EHR HRD-1744499, 9/15/2017–8/31/2019, Co-PI with Valerie Taylor, University of Chicago and Charles Isbell, Georgia Tech. $9,996.

Improving Recruiting and Retention in the the Duke CS undergraduate program, National Center for Women & Information Technology Extension Services, 9/21/2015 – 10/15/2016, $10,000. Co-PIs: Owen Astrachan and Susan Rodger.

RESEARCH TRIANGLE PEER TEACHING FELLOWS: Scalable Evidence-Based Peer Teaching for Improving CS Capacity and Diversity, Google 3X in 3 Years Awards, 5/15/2015 – 5/14/2018, $1,400,631. Co-PIs: Kristy Boyer, (University of Florida), Ketan Mayer-Patel (University of North Carolina), and Sarah Heckman (North Carolina State University),

Duke Robotics Education, Enrichment, and Mentoring, Google RISE Award, 5/16/2011 – 12/31/2011, $10,000.

A Service Learning Course Utilizing Mobile Robots, North Carolina Space Grant Higher Education Course Development Program, 7/1/2010 – 6/30/2011, $10,000.

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, 9/15/2007–8/31/2011, $100,085. Co-PI on multi-institution project led by Andrew Williams , Spelman College.

CPATH CB: Building Community via the Science of Networks, National Science Foundation CISE CNS-0722288, 8/1/2007–7/31/2011, $318,360. Co-PI: Susan Rodger.

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

Doctoral Program in Management and Analysis of Large Data Acquired from Sensors, U.S. Department of Education Graduate Assistance in Areas of National Need (GAANN) Award# P200A070505, 9/1/2007-8/31/2010, $383,643, Co-PI with Agarwal, Lucic, Tomasi, Chase, Parr, Rodger, Babu, Ellis, Yang, Bell, Harer, and Absher.

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

Equipment for Teaching with Robots course, Center for Instruction Technology Jump Start Grant, 4/15/2010 – 12/31/2010, $2,400.

Teaching with Robots, Duke Service-Learning Program Course Enhancement Grant, 6/2/2010 – 12/31/2010, $1,000.

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

DukeScrobbler, 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.

Service

Professional Service

Chair, ACM Education Policy Committee, September 2015–December 2018.
Member, Board of Advisors, Center for Minorities & Persons with Disabilities in Information Technology, June 2016–August 2019.
Co-Chair, Coalition to Diversify Computing, July 2015–June 2016.
Member, Board, CS For All Consortium Steering Committee, June 2016–August 2019.
Member, CRA Conference at Snowbird Organizing Committee, 2016.
Member, CRA Habermann Award Committee, 2016–2017.
Program Chair, Research on Equity and Sustained Participation in Engineering, Computing, and Technology 2015.
Member, Computing Research Association-Education Committee, 2014–2018.
Member, ACM Education Policy Committee, October 2014–September 2015.
Co-Chair, Student Robotics Competition & Member, Organizing Committee, Richard Tapia Celebration of Diversity in Computing Conference, 2007 & 2009.
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, AAAI Spring

Symposium 2008.
Co-Chair, Robot Program & Conference Committee Member, AAAI-2006 & AAAI-2007.
Chair, Mobile Robot Workshop, AAAI-2005.

University Service

Chair, Trinity College Curriculum Committee, 2017–2019.
Member, Executive Committee of Arts & Sciences Council, 2017–2019.
Department Represntative, Arts & Sciences Council, 2017–2019.
Member of the Faculty Advisory Board, Duke Office of Civic Engagement, 2017–2019.
Director, Trinity College Office of Curriculum and Course Development, 2016–2017.
Ex Officio member, Trinity College Curriculum Committee, 2016–2017.
Ex Officio member, Imagining Duke Curriculum Committee, 2016–2017.
Chair, Durham Kunshan University Ad Hoc Curriculum Committee, 2016.
Selection Committee, Goldwater Scholarship, 2016.
Ex Officio member, Course Committee, 2015–2016.
Faculty Athletic Associate, Sep. 2009–May 2011.
Member, University Conduct Board, Jan. 2009–May 2011.
Advisor, OLPC @ Duke student group, Aug. 2008–May 2011.
Advisor, National Society of Black Engineers student group, Aug. 2003–May 2011.
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.

Department Service

Assessment Liaison, 2015–2019.
Computer Science Undergraduate Research Fellows Coordinator, Fall 2007–2015.
Undergraduate Majors Advising, Fall 2001–Spring 2012.
Undergraduate Program committee, 2003 – 2016.
Graduate Recruiting committee, Fall 2006–Spring 2008.

Honors & Awards

ACM Distinguished Member, 2023
Stanford University Distinguished Alumni Scholar, 2013

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