

Samuel Spaulding

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Advisor: Cynthia Breazeal



Research Interests

I work on applications of Artificial Intelligence for Human-Robot Interaction, specifically designing and building robotic systems that exhibit social intelligence, are easy for people to interact with, and can provide engaging and educational experiences.

Education

- 2013–2015 **S.M. Media Arts & Sciences**, *MIT Media Lab*, Cambridge, MA, USA.
Advisor: Cynthia Breazeal. Thesis: "Developing Affect-Aware Robot Tutors."
- 2009–2013 **B.S. Computer Science**, *Yale University*, New Haven, CT, USA.
Graduated with Distinction in the Major. Senior thesis advised by Brian Scassellati.

Research Experience

- 2013-2015 **Graduate Research Assistant, Personal Robots Group**, *MIT Media Lab*, Cambridge, MA.
Developing interactive social robots and novel computational models to enable fluent social interaction and collaboration between humans and robots, particularly through the use of multi-modal, affective user data
- Summer 2012 **Research Associate, Disney Research - Boston**, *Walt Disney Imagineering*, Boston, MA.
Worked with Jonathan Yedidia on a novel sentiment analysis system for Walt Disney Imagineering. Our project, "**Making Sense of the Blogosphere: Semantic Analysis of Text Mined from the Web**" won the **Judges' Special Distinction Award for Methodology** in company-wide Business Intelligence and Data Analytics Competition
- 2010 - 2013 **Research Assistant, Yale Social Robotics Lab**, *Yale University*, New Haven, CT.
Worked with Dan Leyzberg and Brian Scassellati to develop and evaluate robot tutors capable of personalizing to individual learning differences.

Industry Experience

- 2015-Present **Robot Skills Engineer**, *Jibo, Inc.*, Boston, MA.
Working with design and hardware teams to create end-user applications for a consumer home robot that delivers unforgettable experiences through advanced robotics and AI innovation.
- Summer 2011 **Software Development Engineering Intern**, *Amazon, Inc.*, Seattle, WA.
Built internal bug analysis tool and received return offer. Member of four-person team whose submission, an Android app called "SmileIKnow" was a finalist at the 2011 Amazon Mobile Security Hackathon

Awards and Honors

- (2013-present) **National Science Foundation Graduate Research Fellowship**, 3 year fellowship to support graduate education in AI and Robotics
- (2015) **HRI Pioneers Travel Award**, Awarded funding support to attend the Human-Robot Interaction (HRI) Pioneers workshop, a selective workshop that seeks to foster creativity and collaboration across the disciplines of HRI researchers.
- (2013) **Mellon Undergraduate Research Grant**, Awarded funding support to attend HRI 2013 in Tokyo, Japan
- (2012) **Sigma Xi Undergraduate Research Award**, Awarded funding support and membership in Sigma Xi Scientific Society
- (2011) **First Place, Academic Competition Federation (ACF) National Championship**, As part of Yale's Quiz Bowl team, won the premier national event for collegiate academic quiz competition.
- (2010) **First Runner-up, Jeopardy! College Championship**, Won 3 of 4 games and second place overall in the Season 27 Jeopardy! College Championship.

Highly-Refereed Conference Publications

- [C4] **Samuel Spaulding**, Goren Gordon, and Cynthia Breazeal. **Affect-aware Student Models for Robot Tutors**. In *Proceedings of the 15th International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2016, 25% acceptance rate)*.
- [C3] Goren Gordon, **Samuel Spaulding**, Jacqueline Kory Westlund, Jin Joo Lee, Luke Plummer, Marayna Martinez, Madhurima Das, and Cynthia Breazeal. **Affective Personalization of a Social Robot Tutor for Children's Second Language Skills**. In *Proceedings of the 30th AAAI Conference on Artificial Intelligence (AAAI 2016, 26% acceptance rate)*.
- [C2] Dan Leyzberg, **Samuel Spaulding**, and Brian Scassellati. **Personalizing Robot Tutors to Individuals' Learning Differences**. In *Proceedings of the 9th ACM/IEEE International Conference on Human-Robot Interaction (HRI 2014, 24% acceptance rate)*
- [C1] Dan Leyzberg, **Samuel Spaulding**, Mariya Toneva, and Brian Scassellati. **"The Physical Presence of a Robot Tutor Increases Cognitive Learning Gains"**. In *Proceedings of the 34th Annual Conference of the Cognitive Science Society (COGSCI 2012, 40% acceptance rate)*.

Lightly-Refereed Publications

- [W8] Jacqueline Kory Westlund, Goren Gordon, **Samuel Spaulding**, Jin Joo Lee, Luke Plummer, Marayna Martinez, Madhurima Das, and Cynthia Breazeal. **Lessons From Teachers on Performing HRI Studies with Young Children in Schools**. In *Proceedings of the 11th ACM/IEEE International Conference on Human-Robot Interaction: alt.HRI (alt.HRI 2016)*
- [W7] Kory Westlund, J. M., Lee, J., Plummer, L., Faridi, F., Gray, J., Berlin, M., Quintus-Bosz, H., Harmann, R., Hess, M., Dyer, S., dos Santos, K., Adalgeirsson, S., Gordon, G., **Spaulding, S.**, Martinez, M., Das, M., Archie, M., Jeong, S., & Breazeal, C. **Tega: A Social Robot**. In *Proceedings of the 11th ACM/IEEE International Conference on Human-Robot Interaction: Video Presentations (HRI 2016 Video Track) Best Video Nominee*.
- [W6] **Samuel Spaulding** and Cynthia Breazeal. **Towards Affect-Awareness for Social Robots**. In *AAAI 2015 Fall Symposium Series: Artificial Intelligence for Human-Robot Interaction (AI-HRI 2015)*
- [W5] Jacqueline Kory Westlund*, Goren Gordon*, **Samuel Spaulding**, Jin Joo Lee, Luke Plummer, Marayna Martinez, Madhurima Das, and Cynthia Breazeal, **Learning a Second Language with a Socially Assistive Robot**. In *Proceedings of New Friends: The 1st International Conference on Social Robots in Therapy and Education (New Friends 2015)*
- [W4] **Samuel Spaulding** and Cynthia Breazeal. **Affect and Inference in Bayesian Knowledge Tracing with a Robot Tutor**. In *Proceedings of the 10th ACM/IEEE International Conference on Human-Robot Interaction: HRI Pioneers (HRI Pioneers 2015)*

- [W3] **Samuel Spaulding** and Cynthia Breazeal. **Exploring Child-Robot Tutoring Interactions with Bayesian Knowledge Tracing**. In *AAAI 2014 Fall Symposium Series: Artificial Intelligence for Human-Robot Interaction* (AI-HRI 2014)
- [W2] W. Bradley Knox, **Samuel Spaulding** and Cynthia Breazeal. **learning Social Interaction from the Wizard: A Proposal**. In *Proceedings of the 3rd Workshop on Machine Learning for Interactive Systems* held at AAAI 2014
- [W1] **Samuel Spaulding** and Cynthia Breazeal. **Anomaly Perception and Mind Attribution in a Cognitive Architecture for Human-Robot Interaction**. In *Proceedings of the Workshop on Cognitive Architectures for Human-Robot Interaction* held at HRI 2014

Conference Presentations

- AAMAS 2016 Presented publication [C4] **"Affect-aware Student Models for Robot Tutors"** in Singapore
- HRI 2014 Presented publication [C2] **"Personalizing Robot Tutors to Individuals' Learning Differences"** in Bielefeld, Germany

Invited Talks

- 2016 Invited Speaker **Affect-aware Social Robot Tutors**, Affectiva Inc.
- 2015 Invited Speaker **Personal Robots Research Overview**, MIT Media Lab Spring Member Event.
- 2014 Invited Speaker **"Fascinating Alumni: Short Talks"**. Jonathan Edwards College Reunion
- 2014 Guest Lecturer **MAS.111 - Media Arts & Sciences Freshman Symposium**
- 2013 Invited Speaker **Yale Undergraduate Science Symposium**
- 2013 Invited Speaker **Yale Engineering and Science Weekend Symposium**
- 2013 TEDx Speaker **"TEDxYale: Solve for Y"** Conference
- 2012 Invited Speaker **Yale Undergraduate Science Symposium**
- 2012 Invited Speaker **Yale Engineering and Science Weekend Symposium**
- 2010 Invited Panelist, Yale Computer Science Department **IBM Jeopardy! Challenge Discussion**

Teaching

- Fall 2012 **Course Assistant, CS 201: Introduction to Computer Science, Yale University**.
Assisted students with core course concepts. Covered basic topics like recursion through more concepts including formal language theory, logic, and computability theory

Mentoring

Students Supervised

- Katherine Xiao (MIT UROP, Spring 2016)
- Wei Low (MIT UROP, Fall 2015, Spring 2016)
- Christina Wettersten (MIT UROP, Spring 2014)

Professional Service and Leadership

- Reviewer
 - AAAI 2014.
 - HRI 2015, 2016.
- Panel Chair *HRI Pioneers Workshop 2016*. Responsible for organizing the Pioneers workshop panel, determining topics, soliciting panel members, and hosting/moderating.
- Workshop Organizer *Student Technical Workshop*, NSF Expedition on Socially Assistive Robotics. With students at partner institutions, drafted budget, solicited and curated submissions, and coordinated program

Technical Skills and Training

- Software Extensive experience with Java/C/C++, LISP-like languages, Python, MATLAB and R. Strong Web Development and Design skills including HTML/CSS/Javascript, Ruby on Rails, and Node.js. Significant Android mobile development experience.
- Hardware Significant fabrication training and experience with: Laser Cutter, Vinyl Cutter, CNC Mill, Molding/Casting, Composite Materials, and 3D Printing. Significant electronics experience, including PCB design and fabrication, and circuit design for radio, motor, and sensing applications for mobile robots.
- Robots Extensive experience developing and maintaining hardware and software for multiple commercial and in-house robotic platforms, including extensive development experience with ROS and OpenCV.
- Commercial Robot Platforms: iRobot Create, Aldebaran Nao, Beatbots Keepon, and Jibo
 - In-house robots: 57 DOF Mobile-Dexterous-Social (MDS) Humanoid, 6 DOF Dragonbot platform, 5 DOF Tega Platform, and 5 DOF Affective Intelligent Driving Agent (AIDA)