Proposal for a Special Session at IEEE RO-MAN 2023

HRI in Academia and Industry: Bridging the Gap

Aim and Scope of the Special Session

The use of robots that operate in spaces where humans are present is growing at a dramatic rate. We are seeing more and more robots in warehouses, on streets, and even in our homes. All of these robots will, as part of their primary function, interact with humans in some way. In order to be successful, their interactions with humans will have to be carefully designed. The field of Human-Robot Interaction (HRI) has been growing at the intersection of robotics, AI, psychology, and a number of other fields. However, until quite recently, it has been a largely academic area, with university researchers proposing, implementing, and reporting on experiments at a limited scale. With the current increase of commercially-available robots, HRI is starting to make its way into industry in a meaningful way.

This special session is intended to bring together HRI researchers and practitioners from both academia and industry, to discuss how these areas are different in their needs and approaches, and to figure out how HRI researchers and practitioners in these areas can work together – *How can we make academic HRI research and education more relevant to industrial needs? How can industry support and contribute to more science-focused HRI?* The special session will attract contributions on four broad themes, outlined below, in an attempt to build a new community interested in how these two active areas of HRI research and practice can work more closely together, and support each other in practical terms. We welcome research and case study papers with at least one section devoted to addressing some of the questions outlined below in the discussion section. We also invite survey and position paper contributions that directly surveys or discusses some of the below questions.

- **The Constraints and Needs of HRI in Industry**
  - What are the constraints of deploying HRI at scale in consumer robots?
  - What are the pressing HRI problems that the industry wants to solve? Why?
  - How do we measure the success of HRI in a consumer product?
  - What HRI research can we do in an industry setting that we can't do in academia?
- **The Relevance and Innovation of Academic HRI**
  - What are the constraints of HRI research in an academic environment?
  - What industrial or consumer applications drive interesting academic HRI research?
  - How do we measure the success of academic HRI beyond controlled experiments and p-values?
  - What HRI research can we do in an academic setting that we can't do in industry?
- **Interaction between Academic and Industrial HRI: Publications, Conferences, Tools/Technology Resources, and Experiments**
  - What are the constraints of publishing in industry, and how do we address them?
  - How can academic & industrial HRI researchers collaborate meaningfully across the IP boundary?
  - How can industry HRI research benefit more from science-driven approaches?
  - How can academic HRI research benefit more from real-world problems?
- **HRI Education and Training: What does Academia and Industry Need?**
  - What does it mean to be an HRI researcher? What are required skill sets in industry & academia?
  - How should we be training future HRI researchers for industry and academic career paths?
  - Since HRI can touch on all aspects of a robot system, how much HRI should robot hardware and software developers know?
  - How can HRI researchers with interdisciplinary backgrounds integrate successfully with hardware and software development teams? How much technical background do they need to know?

Proposal 19 submitted to 2023 32nd IEEE International Conference on Robot and Human Interactive Communication (RO-MAN). Received January 27, 2023.

Tentative Speakers

1. Designing a commercial robot that hangs out nearby for companionship and assistance in the home; Jin Joo Lee, Amin Atrash, Dylan Glas, Hanxiao Fu; Amazon Lab126
2. Using Alert-based Decision Support To Improve Human-in-the-loop Experimental Design of Autonomous Robots; Jason Gregory, Felix Sanchez, Eli Lancaster, Ali-Akbar Agha-Mohammadi and Satyandra Gupta; DEVCOM Army Research Laboratory, Booz Allen Hamilton, NASA Jet Propulsion Laboratory, University of Southern California
3. Predicting Social Constructs for Human Machine Collaboration Within a Training Context; Peggy Wu, Bruno Abreu Calfa, Stephen Gilbert and Andrew Radlbeck; Raytheon Technologies Research Center, Iowa State University
4. Title TBD; Kerstin Haring; University of Denver

Organizers

Hae Won Park
Amazon Lab126 & MIT Media Lab, USA
E-mail: robohaewon@amazon.com
Short Bio: Hae Won Park, PhD, is a Research Scientist & PI at MIT Media Lab where she leads provocative research in long-term personalization and relationship building in HRI. Now as an Amazon Visiting Scholar, she is teaming up with Lab126 to develop consumer home robots companions. Her research principles are deeply grounded in real-world problems impacting domains such as education, aging, and healthcare.

Sheal Eum
AeiROBOT, Republic of Korea
Email: shealeum@gmail.com
Short Bio: Sheal Eum is the Founder and CEO of AeiROBOT. With her background as a kinetic artist, she strives to bring Robots to All through robot performances, hands-on exhibitions, and designing home robot companions guided by HRI principles. Her close collaboration with academia & student training is an exemplary model of industry-academia synergy.

Chien-ming Huang
Johns Hopkins University, USA
Email: chienming.huang@jhu.edu
Short Bio: Chien-Ming Huang is the John C. Malone Assistant Professor in the Department of Computer Science at the Johns Hopkins University. His research focuses on human-AI teaming and seeks to enable interactive AI technologies capable of providing physical, social, and cognitive support to people with a variety of abilities.

Bill Smart
Amazon Lab126 & Oregon State University, USA
E-mail: robobill@amazon.com
Short Bio: Bill Smart is an Amazon Scholar and a Professor of Robotics and Associate Director of Collaborative Robotics and Intelligent Systems Institute at Oregon State University. Applying his deep expertise in robotics and HRI, he now works with robots at Amazon to think on a larger scale for months and years at a time, enabling people and robots to learn to live and work together.

Ross Mead
Founder and CEO, Semio, USA
Email: ross@semio.ai
Short Bio: Dr. Ross Mead is the Founder and CEO of Semio. His work focuses on the principled design and modeling of fundamental social behaviors (e.g., speech, gestures, eye gaze, social spacing, etc.) that serve as building blocks for autonomous face-to-face human-robot interactions. His research provides the foundations upon which Semio software is being built.

Anastasia K. Ostrowski
MIT Media Lab, USA
Email: akostrow@media.mit.edu
Short Bio: Anastasia K. Ostrowski is a PhD candidate and design researcher at the MIT Media Lab. Her work explores equitable design of robots, AI systems, and design education through co-design, participatory design, and design justice approaches, working with roboticists, co-designers, and policy thinkers in academic and industry settings.