

Jake Brawer, Ph.D.

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RESEARCH OVERVIEW

Summary I build **human–robot collaborative systems** that learn through their interactions. My research draws upon recent innovations in machine learning as well as foundational techniques in artificial intelligence for designing systems that learn and utilize **abstract knowledge** to make social and physical interactions more **naturalistic** and **robust**.

EDUCATION

- 2023–Current **Postdoctoral Researcher** University of Colorado, Boulder,
Advisors: Alessandro Roncone and Bradley Hayes
- 2016–2023 **Ph.D. in Computer Science** Yale University, Advisor: Brian Scassellati
- 2012–2016 **B.A. in Cognitive Science; Computer Science minor** Vassar College

JOURNAL ARTICLES

- Qin, Meiyang, **Brawer, Jake**, and Scassellati, Brian (2022a). “**Robot Tool Use: A Survey**”. In: *Frontiers in Robotics and AI* 9, p. 369.
- * Qin, Meiyang, * **Brawer, Jake**, and Scassellati, Brian (2021). “**Rapidly Learning Generalizable and Robot-Agnostic Tool-Use Skills for a Wide Range of Tasks**”. In: *Frontiers in Robotics and AI* 8, p. 380.
- Brawer, Jake**, Hill, Aaron, Livingston, Ken, Aaron, Eric, Bongard, Joshua, and Long Jr, John H (2017). “**Epigenetic Operators and the Evolution of Physically Embodied Robots**”. In: *Frontiers in Robotics and AI* 4, p. 1.

CONFERENCE PROCEEDINGS

- Brawer, Jake**, Ghose, Debasmita, Candon, Kate, Qin, Meiyang, Roncone, Alessandro, Vazquez, Marynel, and Scassellati, Brian (2023). “**Interactive Policy Shaping for Human-Robot Collaboration with Transparent Matrix Overlays**”. In: *Proceedings of the 2023 ACM/IEEE International Conference on Human-Robot Interaction*. IEEE.
- Qin, Meiyang, **Brawer, Jake**, and Scassellati, Brian (2022b). “**Task-Oriented Robot-to-Human Handovers in Collaborative Tool-Use Tasks**”. In: *2022 31st IEEE International Conference on Robot & Human Interactive Communication (RO-MAN)*. IEEE.
- Brawer, Jake**, Qin, Meiyang, and Scassellati, Brian (2020). “**A causal approach to tool affordance learning**”. In: *2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. IEEE, pp. 8394–8399.
- Brawer, Jake**, Mangin, Olivier, Roncone, Alessandro, Widder, Sarah, and Scassellati, Brian (2018). “**Situated Human–Robot Collaboration: predicting intent from grounded natural language**”. In: *Intelligent Robots and Systems (IROS)*.

- Scassellati, Brian, **Brawer, Jake**, Tsui, Katherine, Nasihati Gilani, Setareh, Malzkuhn, Melissa, Manini, Barbara, Stone, Adam, Kartheiser, Geo, Merla, Arcangelo, Shapiro, Ari, et al. (2018). “**Teaching Language to Deaf Infants with a Robot and a Virtual Human**”. In: *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, p. 553.
- Tan, Zong Xuan, **Brawer, Jake**, and Scassellati, Brian (2018). “**That’s Mine! Learning Ownership Relations and Norms for Robots**”. In: *Thirty-second AAAI conference on artificial intelligence*.

WORKSHOP PROCEEDINGS

- Brawer, Jake**, Bishop, Kayleigh, Hayes, Bradley, and Roncone, Alessandro (2023). “**Towards A Natural Language Interface for Flexible Multi-Agent Task Assignment**”. In: *Proceedings of the AAAI Symposium Series*. Vol. 2. 1, pp. 167–171.

TECHNICAL AND SCIENTIFIC SKILLS

- Programming **Python** (and scientific tools), **C-C++**, **L^AT_EX**, **Git**, **Jekyll**, **Emacs**, **Continuous integration** (with Travis), Docker
- ML/AI Tools Scikit-learn, Pytorch, NLTK, ROS, Gurobi
- Robots 6+ years experience with **Baxter research robot**, 3+ years experience with **UR5 robot**
- System 8+ years of daily **Linux** experience

AWARDS AND FELLOWSHIPS

- July 2023 **Army Educational Outreach Program (AEOP) Fellow**

WORKSHOPS

- March 2023 **Human-Machine Teaming Paradigm Workshop**
Jake Brawer, Bradley Hayes, Alessandro Roncone
- March 2018 **Bridging the Gap: An NSF Workshop on Conversational Agents and Human-Robot Interaction**
Justine Cassell, Brian Scassellati, Jake Brawer, Michael Madaio
NSF Cyber-Human Systems (CHS), Robust Intelligence, National Robotics Initiative. Award #1829237

TEACHING EXPERIENCE

- Spring 2024 **Advanced Robotics**
Lecturer
- Spring
2018/2019 **Intelligent Robotics**
Teaching Assistant
- Fall 2017 **Object Oriented Programming**
Teaching Assistant

Fall 2014/2015 **Perception and Action**

Teaching Assistant

SERVICE

Conference reviews International Conference on Humanoid Robots (**Humanoids**; 2018)
International Conference on Intelligent Robots and Systems (**IROS**; 2020)
International Conference on Human–Robot Interaction (**HRI**; 2017, 2018, 2019, 2020, 2021, 2022, 2023)
International Conference on Robotics and Automation (**ICRA**; 2019)

Journal reviews IEEE Transaction on Robotics (**T-RO**; 2024)
ACM Transactions on Human–Robot Interaction (**THRI**; 2019, 2020)

Students supervised Kevin Choi (2018)
Acshi Haggemiller (2016-2017)
Sarah Widder (2017-2019)
Tan Zong Xuan (2017-2018)
Kaleb Bishop (2017-2019, 2023)
John Dallard (2021-2022)