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

2016-2023 **Ph.D. in Computer Science** *Yale University*, Advisor: Brian Scassellati

Thesis: *Fusing Symbolic and Subsymbolic Approaches for Natural and Effective Human-Robot Collaboration*

Additional Committee: Marynel Vázquez, Julian Jara-Ettinger, Sonia Chernova

2012-2016 **B.A. in Cognitive Science; Computer Science minor** *Vassar College*

Research Experience

2016-2023 **Robotics Ph.D. student** –Social robotics laboratory, *Yale University*
Human–robot collaboration research under the supervision of Professor Brian Scassellati.

2014-2015 **Research Fellow** –Interdisciplinary robotics research lab, *Vassar College*
Designed and programmed a genotype-phenotype mapping scheme for mobile behavior-based robots incorporating sexual reproduction and ontogenetic factors.

Honors and Awards

2023 **Best Paper Nominee**, Human-Robot Interaction (HRI)

Interactive Policy Shaping for Human-Robot Collaboration with Transparent Matrix Overlays

2023 **Outstanding Reviewer**, Human-Robot Interaction (HRI)

2015 **Barry Goldwater Scholarship Nominee**, Vassar College

Journal articles

Qin, Meiying, **Brawer**, **Jake**, and Scassellati, Brian (2022a). "**Robot Tool Use: A Survey**". In: *Frontiers in Robotics and AI* 9, p. 369.

* Qin, Meiying, * **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.

∗ Authors contributed equally

Conference proceedings

Brawer, **Jake**, Ghose, Debasmita, Candon, Kate, Qin, Meiying, 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, Meiying, **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, Meiying, 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*.

Thesis

Brawer, **Jake** (2023). "**Fusing Symbolic and Subsymbolic Approaches for Natural and Effective Human-Robot Collaboration**". PhD thesis. Yale University.

Technical and scientific skills

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

Grants

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 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	ACM Transactions on Human-Robot Interaction (**THRI**; 2019, 2020)
Students supervised	Kevin Choi (2018) Acshi Haggenmiller (2016-2017) Sarah Widder (2017-2019) Tan Zong Xuan (2017-2018) Kayleigh Bishop (2017-2019) John Dallard (2021-2022)