Yuchen Cui

Postdoctoral Scholar
Stanford University

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Research Interests

Machine Learning, Human Robot Interaction, Interactive Robot Learning

Current Position

Jan. 2022 – Present **Postdoctoral Researcher** in Computer Science
Stanford University, Stanford, California
Advisor: Dorsa Sadigh

Education

Aug. 2015 – Dec. 2021 **Doctor of Philosophy** in Computer Science
The University of Texas at Austin, Austin, Texas
Thesis: Learning from Low-effort Human Teaching
Advisor: Scott Niekum

Aug. 2011 – May 2015 **Bachelor of Science** in Computer Engineering (Highest Distinction)
Purdue University, West Lafayette, Indiana

Honors and Awards

2023	EECS Rising Stars
2023	Human-centered AI Institute Postdoctoral Fellow, Stanford University
2022	Best Paper Finalist: RSS Workshop on Scaling Robot Learning
2022	Graduate School Professional Development Award, UT Austin
2017	RoboCup@Home Domestic Standard Platform League, 3rd Place
2015	Intel-Cornell Cup, 2nd Place
2011-2015	College of Engineering Dean's List, Purdue University

Internship Experience

May-Oct. 2021	Facebook AI Research	Remote (Pittsburgh, Pennsylvania)
May-Aug. 2019	Diligent Robotics	Austin, Texas
May-Aug. 2018	Honda Research Institute USA	Mountain View, California

Teaching Experience

2017-2018	CS343: Artificial Intelligence	UT Austin
2015-2016	CS313E: Elements of Software Design	UT Austin
2014	ECE337: ASIC Design Laboratory	Purdue University
2013	ECE364: Software Engineering Tools Lab	Purdue University
2012-2013	CS159: Programming Applications for Engineers	Purdue University

Professional Activities

- Speaker, Invited talk on *Online Language Correction via Shared Autonomy*, Mar. 2023, Georgia Tech
- Speaker, Invited talk on *Leveraging Foundation Models for Zero-shot Task Specification for Robotics*, Oct. 2022, MILA
- Speaker, Invited talk on *Designing Human-Aware Learning Agents*, Jul. 2022, Simons Institute
- Speaker, Invited talk on *Robot Learning from Low-effort Human Teaching*, Apr. 2021, Stanford University
- Speaker, Invited talk on *Learning from Low-effort Human Teaching*, Feb. 2021, UC Berkerley
- Speaker, Invited talk on *Learning from Implicit Human Feedback*, Nov. 2020, Tufts University
- Organizer, RSS 2020 Workshop on *Advances & Challenges in Imitation Learning for Robotics*
- Co-Chair, Imitation Learning session, International Conference on Intelligent Robots and Systems (IROS) 2023
- Reviewer, Robotics: Science and Systems (RSS) 2019, 2022, 2023
- Reviewer, International Conference on Learning Representations (ICLR) 2021, 2022
- Reviewer, International Conference on Intelligent Robots and Systems (IROS) 2021, 2023
- Reviewer, International Conference on Machine Learning (ICML) 2021
- Reviewer, Conference on Neural Information Processing Systems (NeurIPS) 2020, 2021
- Reviewer, Conference on Robot Learning (CoRL) 2020
- Reviewer, International Conference on Robotics and Automation (ICRA) 2019, 2021
- Reviewer, ACM Transactions on Human-Robot Interaction 2018

Outreach

- Mentor, Stanford UGVRI: advise undergraduate visiting research interns (2023)
- Mentor, Stanford CURIS: advise undergraduate research interns in CS (2022)
- Mentor, UTCS Directed Research Program: lead paper discussions with undergraduate students (2021)
- Exhibitor, Explore UT: demonstrate robots for campus visitors (2018)
- Instructor, Hour of Code: teach one-hour coding classes at a local middle school (2016)

Peer-Reviewed Conference & Journal Publications

[1] *Data Quality in Imitation Learning.*
Suneel Belkhale, **Yuchen Cui**, Dorsa Sadigh.
Conference on Neural Information Processing Systems (NeurIPS), Dec 2023.

[2] *Gesture-Informed Robot Assistance via Foundation Model*
Li-Heng Lin, **Yuchen Cui**, Yilun Hao, Fei Xia, Dorsa Sadigh.
Conference on Robot Learning (CoRL), Nov 2023.

[3] *HYDRA: Hybrid Robot Actions for Imitation Learning.*
Suneel Belkhale, **Yuchen Cui**, Dorsa Sadigh. Conference on Robot Learning (CoRL), Nov 2023.

[4] *Masked Imitation Learning: Discovering Environment-Invariant Modalities in Multimodal Demonstrations*
Yilun Hao*, Ruinan Wang*, Zhangjie Cao, Zihan Wang, **Yuchen Cui**, Dorsa Sadigh.
IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct 2023.

[5] *"No, to the Right" – Online Language Corrections for Robotic Manipulation via Shared Autonomy*
Yuchen Cui*, Sidd Karamcheti*, Raj Palleti, Nidhya Shivakumar, Percy Liang, Dorsa Sadigh.
ACM/IEEE International Conference on Human-Robot Interaction (HRI), Mar 2023.

[6] *Can Foundation Models Perform Zero-Shot Task Specification For Robot Manipulation?*
Yuchen Cui, Scott Niekum, Abhinav Gupta, Vikash Kumar, Aravand Rajeswaran.
Learning for Dynamics & Control Conference (L4DC), Jun 2022.

[7] *Understanding the Relationship between Interactions and Outcomes in Human-in-the-Loop Machine Learning.*
Yuchen Cui, Pallavi Koppol, Henny Admoni, Scott Niekum, Reid Simmons, Aaron Steinfeld, Tesca Fitzgerald.
The International Joint Conference on Artificial Intelligence (IJCAI), Montréal, Québec. Aug 2021.

[8] *The EMPATHIC Framework for Task Learning from Implicit Human Feedback.*
Yuchen Cui*, Qiping Zhang*, Allesandro Allievi, Peter Stone, Scott Niekum, and W. Bradley Knox.
Conference on Robot Learning (CoRL), Nov 2020.

[9] *Uncertainty-Aware Data Aggregation for Deep Imitation Learning.*
Yuchen Cui, David Isele, Scott Niekum and Kiko Fujimura.
IEEE International Conference on Robotics and Automation (ICRA), May 2019.

[10] *Risk-Aware Active Inverse Reinforcement Learning.*
Yuchen Cui, Daniel Brown and Scott Niekum.
Conference on Robot Learning (CoRL), Oct 2018.

[11] *Active Reward Learning from Critiques.*
Yuchen Cui and Scott Niekum.
IEEE International Conference on Robotics and Automation (ICRA), May 2018.

[12] *Modeling Sensory-Motor Decisions in Natural Behavior*
Ruohan Zhang, S. Zhang, M. H. Tong, **Yuchen Cui**, C. A. Rothkopf, Dana H. Ballard and Mary M. Hayhoe.
PLOS Computational Biology, 2018.

[13] *Indoor Follow Me Drone*
Wenguang Mao, Zaiwei Zhang, Lili Qiu, Jian He, **Yuchen Cui**, and Sun Yun.
International Conference on Mobile Systems, Applications, and Services (MobiSys), Jun 2017.

Workshop Publications

[1] *Shared Autonomy for Robotic Manipulation with Language Corrections.*
S. Karamcheti, R. Palleti, **Y. Cui**, P. Liang, D. Sadigh.
Workshop on Learning with Natural Language Supervision ACL, May 2022.

[2] *Aux-AIRL: End-to-End Self-Supervised Reward Learning for Extrapolating beyond Suboptimal Demonstrations.*
Y. Cui, B. Liu, A. Saran, S. Giguere, P. Stone, and S. Niekum.
ICML Workshop on Self-Supervised Learning for Reasoning and Perception, July 2021.

[3] *Reaction Modeling for Deriving General Task Information from Implicit Human Feedback.*
Y. Cui, Q. Zhang, S. Jain, A. Allievi, P. Stone, S. Niekum, and W. Knox.
HRI Workshop on Exploring Applications for Autonomous Non-Verbal Human-Robot Interactions, Mar 2021.

[4] *Demonstration of the EMPATHIC Framework for Task Learning from Implicit Human Feedback.*
Y. Cui, Q. Zhang, S. Jain, A. Allievi, P. Stone, S. Niekum, and W. Knox.
AAAI-21 Demonstrations Program, Feb 2021.

[5] *Active learning from critiques via bayesian inverse reinforcement learning.*
Y. Cui and S. Niekum.
RSS Workshop on Mathematical Models, Algorithms, and Human-Robot Interaction. Jul 2017.

[6] *Trajectory-based visual analytics for anomalous human movement analysis using social media.*
J. Chae, **Y. Cui**, Y. Jang, G. Wang, A. Malik, D.S. Ebert.
EuroVis Workshop on Visual Analytics (EuroVA), May 2015.

References

- Scott Niekum: sniekum@cs.umass.edu
- Dorsa Sadigh: dorsa@cs.stanford.edu