

Michelle Zhao

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RESEARCH

Human-robot interaction with a focus on active learning from feedback and uncertainty quantification.

EDUCATION

Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

- Ph.D. Student in Robotics Aug 2020 – Current
 - Advisors: Henny Admoni and Reid Simmons
 - Focus: Uncertainty Quantification, Learning from Human Feedback, Human-Robot Collaboration

California Institute of Technology, Pasadena, California, USA

- B.S. in Computer Science Sep 2016 – Jun 2020
 - Minor: Information and Data Science

PUBLICATIONS

CONFERENCES

- C11 Vats, S.* , Zhao, M.*, Callaghan, P., Jia, M., Likhachev M., Kroemer, O., Konidaris, G. Cost-Optimal Interactive Learning on the Job via Facility Location Planning. Under review at RSS 2025.
- C10 Zhao, M., Admoni, H., Simmons R., Ramdas, A.* , Bajcsy, A.* Conformalized Interactive Imitation Learning: Handling Expert Shift and Intermittent Feedback. ICLR 2025.
- C9 Tecson, M., Chen, D., Zhao, M., Simmons R., Erikson, Z. Leveraging Large Language Models for Preference-Based Sequence Prediction. ICAART 2025.
- C8 Zhao, M., Simmons R., Admoni, H., Bajcsy, A. Conformalized Teleoperation: Confidently Mapping Human Inputs to High-Dimensional Robot Actions. RSS 2024.
- C7 Pandya, R.* , Zhao, M.*, Liu C., Simmons R., Admoni, H. Multi-Agent Strategy Explanations for Human-Robot Collaboration. ICRA 2024.
- C6 Zhao, M., Simmons R., Admoni, H. (June 2023). Learning Human Contribution Preferences in Collaborative Human-Robot Tasks. CORL 2023.
- C5 Zhao, M., Simmons R., Admoni, H. (October 2022). Coordination with Humans via Strategy Matching. IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2022.
- C4 Eadeh, F. R., Zhao, M., Nguyen, T.N., Gupta, P., Gonzalez, C., Admoni, H., Woolley, A.W. (October 2022). Good for me, but bad for we: How anger can motivate individual performance but inhibit teamwork. ACM Collective Intelligence Conference 2022.
- C3 Zhao, M.*, Eadeh F.* , Admoni, H. (September 2022). Evaluating and Predicting Collective Intelligence as a Latent Variable via Hidden Markov Models. 15th International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS). 2022.
- C2 Eadeh, F. R., Zhao, M., Nguyen, T.N., Gupta, P., Gonzalez, C., Admoni, H., Woolley, A.W. (June 2021). Does anger help or hurt individual and team performance? ACM Collective Intelligence Conference 2021.
- C1 Foust, R., Zhao, M., Oliver, S., Chung, S., Hadaegh, F. (2017) Distributed Control Of An Evolving Satellite Assembly During In-Orbit Construction. In 68th International Astronautical Congress, 25-29 September 2017, Adelaide, Australia.

PEER-REVIEWED JOURNAL ARTICLES

- J2 Zhao, M., Simmons, R., Admoni, H. (2022) The Role of Adaptation in Human-AI Teaming. Topics in Cognitive Science (topiCS), Special Issue on Building the Socio-Cognitive Architecture of COHUMAN: Collective Human-Machine Intelligence.
- J1 Zhao, M.*, Eadeh F.* , Admoni, H. (2022). Teaching Agents to Understand Teamwork: Evaluating and Predicting Collective Intelligence as a Latent Variable via Hidden Markov Models. Computers in Human Behavior.

PEER-REVIEWED WORKSHOP PAPERS

- W8 Zhao, M., Admoni, H., Simmons R., Ramdas, A.*, Bajcsy, A.* Conformalized Interactive Imitation Learning: Handling Expert Shift and Intermittent Feedback. 7th Robot Learning Workshop: Towards Robots with Human-Level Abilities at ICLR 2025; April 2025
- W7 Moorman, N., Zhao, M., Leubbers, M., van Waveren, S., Simmons, R., Admoni, H., Gombolay, M. Bi-Directional Mental Model Reconciliation for Human-Robot Interaction with Large Language Models; AAAI Workshop on Advancing Artificial Intelligence through Theory of Mind (ToM4AI); AAAI, March 2025.
- W6 Moorman, N., Zhao, M., Admoni, H, Simmons, R., Gombolay, M. HRI'24: Workshop on Aging in Place; HRI, March 2024.
- W5 Zhao, M., Zhu, H., Simmons, R., Bisk, Y., Admoni, H. Large Language Models as Proxies for Evaluating Collaborative Norms; HRI Workshop on Scarecrows in Oz: Large Language Models; HRI, March 2024.
- W4 Morris, N., Zhao, M., Simmons, R., Admoni, H. Machine Teaching of Collaborative Policies for Human Inverse Reinforcement Learning, In RL-CONFORM Workshop: RL Meets HRI, Control, and Formal Methods; IROS, October 2023. **Best Poster Presentation Award**
- W3 Chen, D., Zhao, M., Simmons, R. Learning Human Preferences for Personalized Assistance in Household Tasks, In AAAI Workshop on User-Centric Artificial Intelligence for Assistance in At-Home Tasks; AAAI, February 2023.
- W2 Zhao, M., Simmons, R., Admoni, H. Adapting Language Complexity for AI-Based Assistance, In Workshop Your Study Design Workshop; International Conference on Human-Robot Interaction, March 2021.
- W1 Zhao, M., Simmons, R., Admoni, H. Adapting Language Complexity for AI-Based Assistance, In Workshop on Lifelong Learning and Personalization in Long-Term Human-Robot Interaction; International Conference on Human-Robot Interaction, March 2021.

TALKS

- T12 “Conformalized Teleoperation: Uncertainty Quantification in Shared Autonomy” Nov 2024
 - Talk at ROB 498/599: Computational HRI (Graduate) Course at University of Michigan, taught by Christoforos Mavrogiannis.
- T11 “Alignment and Active Learning in HRI” Oct 2024
 - Talk at Graduate HRI Course at CMU 2024, taught by Andrea Bajcsy.
- T10 “Conformalized Teleoperation: Confidently Mapping Human Inputs to High-Dimensional Robot Actions” Jul 2024
 - Oral at RSS 2024.
- T9 “How to organize a workshop, and Highlights from our HRI 2024 workshop on HRI for Aging in Place” Apr 2024
 - Talk at AI-CARING Student Symposium 2024.
- T8 “Conformalized Assistive Teleoperation: Confidently Mapping Human Inputs to High-Dimensional Robot Actions” Mar 2024
 - Presentation at Intent+LeCar lab meeting.
- T7 “Intent, Theory of Mind, and Implicit Communication in HRI” Mar 2024
 - Lecture in Undergraduate Human-Robot Interaction course at CMU, taught by Henny Admoni.
- T6 “Towards Proactive, Collaborative Robots” Feb 2024
 - Presentation at CMU Robotic Caregiving and Human Interaction (RCHI) Lab (PI: Zackory Erickson).
- T5 “Examining the Role of Adaptation in Human-Robot Collaboration” Mar 2023
 - In-person oral presentation at CMU - Speaking Qualifier
 - Virtual presentation at MITRE Human-Machine Teaming Community of Interest Discussion Session
- T4 “Coordination with Humans via Strategy Matching” Oct 2022
 - Oral presentation at the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) 2022
- T3 “Implicit Communication” Sep 2022
 - Lecture in Graduate Human-Robot Interaction course at CMU, taught by Henny Admoni.
- T2 “Evaluating and Predicting Collective Intelligence as a Latent Variable via Hidden Markov Models.” Sep 2022

- Oral presentation at the 15th International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRIMS)
- T1 “Adapting Language Complexity for AI-Based Assistance” Mar 2021
- In Workshop on Lifelong Learning and Personalization in Long-Term Human-Robot Interaction; International Conference on Human-Robot Interaction
 - In Workshop Your Study Design; International Conference on Human-Robot Interaction

FELLOWSHIPS & AWARDS

- **Rising Stars in Computational and Data Sciences**, to be held at UT Austin. 2025
- **HRI Pioneers 2025 Honorable Mention** 2025
- **DoD NDSEG Fellowship**, Carnegie Mellon University 2022
- **NCWIT Collegiate Award, Finalist** 2022
- **Uber PhD Fellowship**, Carnegie Mellon University 2021
- **George W. Housner Student Discovery Award**, California Institute of Technology 2019
- **Beckman Coulter Scholarship** 2016
- **Intuit Scott Cook Award** 2016
- **Dollars for Scholars Scholarship** 2016

ACADEMIC SERVICE

Workshop and Conference Organization

- Co-Organizer, *Lifelong Learning and Personalization in Long-Term Human-Robot Interaction (LEAP-HRI)*, 20th ACM/IEEE International Conference on Human-Robot Interaction, March 2025
- Co-Organizer, *Fall AAI Symposium on AI for Aging in Place*, November 2024, Washington D.C.
- Co-Organizer, *AI-CARING Student Symposium 2024*, University of Massachusetts at Lowell, 2024
- Co-Organizer, *Workshop on HRI for Aging in Place*, ACM/IEEE International Conference on Human-Robot Interaction, 2024
- Program Committee, *MULTITRUST2: International Workshop on Multidisciplinary Perspectives on Human-AI Team Trust*, HHAI conference, 2024
- Program Committee, *MULTITRUST: International Workshop on Multidisciplinary Perspectives on Human-AI Team Trust*, HHAI conference, 2023
- Co-Organizer, *AI-CARING Student Symposium 2023*, CMU, 2023
- Reviewer, *RSS, ICRA, IROS, HHAI, CORL, TIS, HRI, ICLR, INGroup, THRI, ISRR, IEEE RA-L*

Membership and Involvement

- CMU Human-Robot Interaction Reading Group, *Organizer*, 2020-current
- CMU HRI Winter Holiday Potluck, *Organizer*, Dec 2025
- CMU HRI Winter Holiday Potluck, *Organizer*, Dec 2024
- CMU RI Graduate Student Orientation, *Volunteer*, 2023-2024
- CMU HRI Summer Picnic, *Organizer*, June 2024
- RI Women and Non-binary Lunches Group, *Co-organizer*, Oct 2022 -Dec 2024
- CMU RI Climate Committee, *Member*, 2022-2024
- CMU AI/ML Mentoring Program, *Graduate student mentor*, 2020-2024
- CMU SCS Dean’s PhD Student Advisory Committee Anti-Racism Working Group, *Student member*, 2020-2021

TEACHING

Co-Instructor

- Human Robot Interaction (Undergraduate), Spring 2025. Co-Instructor: Zackory Erickson *Eberly Future Faculty Program (Completed, Spring 2024.)*

Graduate Teaching Assistant

- Human Robot Interaction (Graduate), Fall 2022. Instructor: Henny Admoni
- Human Robot Interaction (Undergraduate), Spring 2022. Instructor: Henny Admoni

Undergraduate Teaching Assistant

- Networks: Structure and Economics, Winter 2020. Instructor: Adam Wierman
- Machine Learning and Data Mining, Winter 2019. Instructor: Yisong Yue
- Machine Learning Systems, Fall 2018. Instructor: Yaser Abu-Mostafa

MENTORING

- Ethan Villalovoz, 2024, *Undergraduate, RISS*
- Michaela Tecson, 2023-2024, *MS in Robotics*
- Nyomi Morris, 2023, *Undergraduate, RISS*, PhD student at Colorado School of Mines

- Narit Trikasemsak, 2023, *Undergraduate*, *RISS*
- Daphne Chen, 2022-2023, *MS in Robotics*, PhD student at University of Washington
- Yize (Sean) Shen, 2022, *Undergraduate*
- Thomas Cantalapiedra, 2022, *Undergraduate*
- Yitong (David) Chen, 2022, *Undergraduate*
- Timothy Hyun, 2022, *Undergraduate*

**OTHER WORK
EXPERIENCE**

Virtualitics, Los Angeles, California, USA

Machine Learning Intern

Jun 2020 – Sep 2020

- Developed a named entity recognition pipeline for processing natural language datasets
- Built an outlier and error detection system using a voting-based model of several anomaly detection techniques.
- Developed a classifier for breast cancer tumor detection.
- Analyzed runtimes and capabilities of six graph visualization software (whitepaper).

Goldman Sachs, New York, New York, USA

Summer Analyst

May 2019 – Aug 2019

- Predicted intraday trade volume and distribution using spline regression and autoregressive techniques.
- Analyzed usage of internal applications in order to propose directions for the upcoming update.

Vectra Networks, San Jose, California, USA

Data Science Intern

Jun 2018 – Sep 2018

- Developed machine-learning based algorithms to predict normal, recurrent behavior in network traffic anomaly patterns, using random forests and logistic regression models.
- Engineered predictive models for detecting anomalies in the timing of network authentication requests.

Caltech Aerospace Robotics and Control Lab, Pasadena, California, USA

Undergraduate Research Fellow

May 2017 – Oct 2017

- Designed a computer-vision based approach to aerial navigation in GPS-denied environments using road extraction and designed a novel docking mechanism for multi-agent robot formations.
- Programmed a multi-agent swarm robot system and with an offline distributed control algorithm.

[CV compiled on 2025-03-05]