Rachel Ma

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Education

Massachusetts Institute of Technology *Sept 2023 – Present,*
S.M and Ph.D. in Electrical Engineering and Computer Science *S.M. completed Feb 2025*

- **Research:** AI (NLP, Vision, Foundation Models, Robotics) and uncertainty quantification to help with alignment, better decision-making and reasoning between humans and AI agents/autonomous systems/robots for assisting humans with everyday tasks in open-ended scenarios. Advised by Dylan Hadfield-Menell.
- **Master's Thesis:** *Goal Inference from Open-Ended Dialog*
- **Coursework:** Robotic Manipulation, Computer Vision, TinyML and Efficient DL, Advanced Algorithms. GPA: 5.0/5.0

Brown University *Sept 2019 - May 2023*
B.Sc in Computer Science with Honors, and A.B in Music with Honors

- **Honors Theses:** *"Skill Generalization With Verbs"* (CS) and *"Odyssey"* (Music)
- **Relevant Coursework:** Artificial Intelligence, Intro to Comp. Systems, Computer Vision, Collaborative Robotics, Theory of Computation, Software Security Exploitation, User Interface and Experience, Deep Learning, Discrete Struc. and Probability, Linear Algebra, Statistics, Multivariable Calculus

University of Toronto Schools *Sept 2013 - June 2019*
Middle and High School Diplomas

Research Experience

Graduate Researcher *Cambridge, MA*
Computer Science and Artificial Intelligence Lab, MIT CSAIL *2023-Present*

- Algorithmic Alignment Group, Advised by Dylan Hadfield-Menell.

Research Intern *Cambridge, MA*
MIT-IBM AI Watson Lab *June 2025 - Sept 2025*

- Uncertainty Quantification for Process Reward Model/Large Language Model Calibration. Supervisor: Kristjan Greenewald.

Undergrad Robotics and NLP Researcher *Providence, RI*
Brown University *Jan 2022- Aug 2023*

- Led research project in robotics and NLP through transferring skills/verb actions across different objects, from ideation to submitted first author paper. Advised by George Konidaris and Stefanie Tellex.

Undergrad Choreorobotics Researcher *Providence, RI*
Brown University *Jan 2021 - Dec 2021*

- Helped with grant writing and designing curriculum for Choreo-robotics 101 class.
- Led beat detection project to develop reactive dancing robots, worked with Spot and Baxter robots (primarily in sim). Supervised by Stefanie Tellex.

Undergrad Drone and STEM Education Researcher, Project Manager, and Communications Lead *Providence, RI*
Mar 2020 - Dec 2021
Brown University

- Led meetings, developed curriculum, organized training and outreach, and led tech support for high schools.
- Research with autonomous drones and systems: built drones, used ROS, localization, and PID control. Supervised by Stefanie Tellex.

Publications

Conference Publications

R.Ma, J.Qu, A.Bobu, D. Hadfield-Menell. "Open-Universe Assistance Games", under review, 2025. https://doi.org/10.48550/arXiv.2508.15119

D.Turturean, D. Hadfield-Menell, **R.Ma** "Steering Vector Transfer via Orthonormal Transformations and Semantic Pairing", under review, 2025.

P J.K. Christoffersen, **R.Ma**, W.Savage, P.Barragan, D. Hadfield-Menell "Distilling TAMP Into End-to-End Policies for Effective Online Belief-Space Planning", under review, 2025.

R. Ma, L. Lam, B.A. Spiegel, A. Ganeshan, R. Patel, B. Abbatematteo, D. Paulius, S. Tellex, G. Konidaris "Skill Generalization With Verbs", in International Conference for Intelligent Robots and Systems (IROS) 2023, Accepted. 10.1109/IROS55552.2023.10341472

Workshop Publications

D.Turturean, D. Hadfield-Menell, **R.Ma** "The Interpretable Geometry of Writing Style: Using Rotations and Scaling to Align Llama, Mistral, and Gemma", at the New England Mechanistic Interpretability (NEMI) Workshop, 2025.

R. Ma, D. Hadfield-Menell "Learning Human Preferences through Open-Ended Dialog", in the Generative Modeling meets HRI Workshop at Robotics: Science and Systems (RSS) 2024. Accepted. **Runner Up Best Paper.**

Master's Thesis:

R.Ma. "Goal Inference from Open-Ended Dialog", Feb 2025, https://hdl.handle.net/1721.1/158960.

Awards and Honors

– Real. Strong. Women of Distinction Award – Alpha Chi Omega	Summer 2025
– Best Paper Runner Up for Generative Modeling meets HRI Workshop at Robotics: Science and Systems (RSS) 2024	Summer 2024
– MIT Presidential Fellowship	Sept 2023 - May 2024
– Gordon Wu Fellowship, 5 years, Declined (Princeton)	Feb 2023
– MH. Mann Premium Award (for excellence in music/music appreciation, Brown Music)	May 2023
– Norman K. Meyrowitz Award (for exceptionally meritorious service to Brown CS)	May 2023
– Honorable Mention for Computing Research Association (CRA) Outstanding Undergraduate Researcher Award	Dec 2022
– Molly and David Wadhwani Foundation Meta UTAship in honor of Andy van Dam (Brown CS)	Fall 2022
– Norm Meyrowitz '81 Meta-TAship in honor of Ugur Cetintemel (Brown CS)	Spring 2022
– Margery MacColl Award (Brown Music)	2021
– Karen T. Romer Undergraduate Teaching and Research Awards (UTRA) x 2	Summer 2021 and 2020
– Canadian Young Physicists Tournament (CaYPT), Silver (2018) Bronze (2019)	2018, 2019
– Canadian Intermediate Mathematics Contest (Top 25%)	2016

Mentoring Experiences

Mentoring Undergrads via the UROP program: David Turturean (Spring 2025 – present), Hannah Gao (Spring 2025 – present), Rebecca Wang (Summer 2025 – present), Jingyi "Joyce" Qu (Summer 2024 – Summer 2025)

MIT EECS/CSAIL Buddy	Sept 2024 - Present
MIT Thriving Stars Buddy	Sept 2024 - Sept 2025
Brown Meiklejohn Peer Advisor to First Years	Sept 2020 - May 2022

Teaching Experiences

Computer Science Meta Teaching Assistant Oct 2021 - May 2023
Brown University, CS Department

- One of two/four MTAs who coordinated Brown's CS TA program, managed, and led approx 60 HTAs and 400 UTAs each semester, and communicated between undergrads, technical staff, and CS faculty. Also represented the CS department at various events across campus.

Computer Science Head Teaching Assistant Sept 2021 - May 2022
Brown University, CS Department

- worked with professors on homework and course development, administrative duties, autograder scripts, trained and led TAs for classes, in addition to regular UTA duties.
- Artificial Intelligence (CSCI 1410: Fall 2021)
- Introduction to Discrete Math and Probability Structures (CS0220, Spring 2022)

Computer Science Undergrad Teaching Assistant Sept 2020 - May 2021
Brown University, CS Department

- held TAs hours for students, answered forum posts, assignment development, led lab sections and discussions, graded assignments and projects.
- Computing Foundations: Data (CS0111, Fall 2020)
- Cybersecurity and International Relations (CS1800, Spring 2021)

Music Keyboard Lab Undergrad Teaching Assistant
Brown University, Music Department

- held private TA sessions one on one with students to teach keyboard lab exercises and techniques: sight reading, clef reading, scales/arpeggios, learning short piano pieces, ear training, and harmonization.
- MUSC400A, MUSC400B, MUSC550

Invited Panels/Talks

AI Research Panel October 2025
AI Robotics Ethics Society (AIRES) at Brown University
Exploring Human Centered AI, Research, and Interdisciplinary Learning May 2025
Biocataalysis
Girls in Technology Panel April 2025
Girls in Technology Conference hosted at University of Toronto Schools

Academic Service

Leadership: Graduate Representative on the MIT Women's Advisory Group (2025-2026), Co-President Graduate Women in MIT EECS (2024-2025), Ashdown Graduate Dorm Events Officer and Chair (Sept 2024–Present)
Conference Reviewing: ICRA (2025), AAAI (2025)
Workshop Reviewing: NEURIPS (2025), CORL (2024)
Representing MIT EECS: Grace Hopper (2024), various official MIT EECS grad student admission FAQs

Other Experiences

Alpha Chi Omega, Brown University Feb 2021 - May 2023
Various chair positions
Composition 2014 – Present
Composed and recording pieces for a variety of music ensembles
Piano 2006 – Present
Licentiate Diploma (LRCM, 2019) , Associate Diploma (ARCT, ,2016) in Piano Performance from the Royal Conservatory of Music (RCM). Active as a piano soloist, chamber musician (duos and piano trio), accompaniment, large ensemble work. Recordings from performances at Brown: https://youtu.be/LjCFzkgYXkY, https://youtu.be/wTzGq1DfR9I, https://youtu.be/IgPQboKMYNI?t=4066