PRAGATHI PRAVEENA

HUMAN-ROBOT AND HUMAN-COMPUTER INTERACTION RESEARCHER

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RESEARCH OVERVIEW

My research focuses on designing intelligent, interactive systems that **enhance collaboration in group settings**. In teams, families, and classrooms, individuals bring different goals, abilities, and constraints to their shared endeavors. These differences can fuel collaboration but may also create miscommunication, inefficiency, and conflict. Through human-centered design, I develop robotic and AI systems that mediate these differences to improve collective outcomes while respecting human diversity.

CURRENT POSITION

2024 — Present   **Postdoctoral Fellow**, Robotics Institute, Carnegie Mellon University
PI: Reid Simmons

EDUCATION

2017 — 2024   **M.S. and Ph.D. in Computer Sciences**, University of Wisconsin–Madison, USA
Dissertation Title: Towards Effective Robotic Groupware
Committee: Bilge Mutlu (co-chair), Michael Gleicher (co-chair), Michael Zinn, Robert Radwin

2011 — 2015   **Bachelor of Technology in Electrical Engineering**, Indian Institute of Technology Madras, India

GRANTS

2023   **Google Award for Inclusion Research**
Co-authored research proposal with Bilge Mutlu (PI), **$60,000**
Topic: Supporting Social Participation for Older Adults through Robotic Telepresence

2023   **Collaboration with Boeing Research & Technology**
Co-authored research proposal with Bilge Mutlu (PI) and Michael Hagenow, **~$60,000**
Topic: Exploring Opportunities for Robotic Assistance in Remote Worker Training

2023   **Expanding Our Vision Award, McPherson Eye Research Institute, UW–Madison**
Co-authored research proposal with Bilge Mutlu (PI), **$10,000**
Topic: Designing Interfaces to Enhance the Experience of Remote Vision through Robotic Cameras

HONORS & AWARDS

2024   **Rising Stars in EECS**, Massachusetts Institute of Technology *(19% acceptance)*
2024   **Best Paper Award**, AAAI Fall Symposium on Unifying Representations for Robot Application Development
2023   **ACM SIGCHI Gary Marsden Travel Award**
Selective award for full support to attend ACM Conference on Human Factors in Computing Systems (CHI)
2023   **HRI Pioneer**, ACM/IEEE Conference on Human-Robot Interaction (HRI)
Fully funded participant in selective doctoral consortium *(25% acceptance)*

2020	**RSS Pioneer**, Robotics: Science and Systems (RSS)
	Fully funded participant in selective doctoral consortium *(32% acceptance)*
2020	**Best Paper Award Finalist** *(top 5%)*, ACM/IEEE Conference on Human-Robot Interaction (HRI)
2016	**Xerox Patent Award**, Awarded by Xerox to the lead inventor on a filed patent
2015	**Institute Blues** *(top 3 in ~800 graduates)*, IIT Madras
	Motorola Prize *(#1 in ~150 EE and CS graduates),* IIT Madras
	Recognized for exceptional overall achievement during undergraduate studies
2014	**French Government Charpak Scholarship**
	Two months of support for research experience at École Normale Supérieure, Paris

WORK & RESEARCH EXPERIENCE

2024 — Present	**Postdoctoral Fellow**, Robotics Institute, **Carnegie Mellon University**
	Led collaborative research project at NSF AI-CARING Institute
2017 — 2024	**Graduate Researcher**, People and Robots Lab, **University of Wisconsin–Madison**
	Designed, built, and evaluated human-robot interfaces to enable remote and collaborative work
2015 — 2017	**Junior Research Scientist**, Data Analytics Lab, **Xerox Research Centre India**
	Developed and evaluated novel algorithms to estimate respiratory patterns using a webcam
	Patents licensed by a California-based baby monitor startup
Spring 2015	**Undergraduate Researcher**, Assistive Technology Lab, **Indian Institute of Technology Madras**
Summer 2014	**Undergraduate Researcher**, Group for Neural Theory, **École Normale Supérieure, France**
Summer 2013	**Project Intern**, Electrical and Electronics Maintenance, **Bosch India**

PUBLICATIONS

My research has been published in top-tier venues in HCI and robotics; *indicates equal contribution, <u>indicates</u> students I mentored.

UNDER REVIEW

| *CHI '26* | **Praveena, P.**, <u>Gupta, A.</u>, London, A. J., Dishop, C. R., Lee, A., Admoni, H., Kim, J., Woolley, A.W., Zimmerman, J., Simmons, R. *ACM Conference on Human Factors in Computing Systems.* |
| *HRI '26* | <u>Tan, G. H.</u>*, <u>Han, J.</u>*, <u>Kondapalli, P.</u>*, <u>Ding, R.</u>*, Puthuveetil, K., Tecson, M., **Praveena, P.**, Erickson Z., Simmons, R. *ACM/IEEE International Conference on Human-Robot Interaction.* |

JOURNAL ARTICLES/REFEREED FULL CONFERENCE PAPERS

[P16] UIST '25	<u>Hu, Y.</u>, Sato, A. J., Du, J., Ye, C., Zhu, A., **Praveena, P.**, & Mutlu, B. "NarraGuide: an LLM-based Narrative Mobile Robot for Remote Place Exploration." *ACM Symposium on User Interface Software and Technology.*
[P15] DIS '24	<u>Lee, C. P.</u>, **Praveena, P.**, & Mutlu, B. "REX: Designing User-centered Repair and Explanations to Address Robot Failures." *ACM Conference on Designing Interactive Systems.*
[P14] IEEE Access '24	<u>Wang, Y.</u>, **Praveena, P.**, & Gleicher, M. "A Design Space of Control Coordinate Systems in Telemanipulation." *IEEE Access.*
[P13] CSCW '23	**Praveena, P.**, <u>Wang, Y.</u>, Senft, E., Gleicher, M., & Mutlu, B. "Periscope: A Robotic Camera System to Support Remote Physical Collaboration." *Proceedings of the ACM on Human-Computer Interaction, 7*(CSCW2).

[P12] ICRA '23	Wang, Y., **Praveena, P.**, Rakita, D., & Gleicher, M. "RangedIK: An Optimization-Based Robot Motion Generation Method for Ranged-Goal Tasks." *IEEE International Conference on Robotics and Automation.*
[P11] IROS '22	Senft, E.*, Hagenow, M.*, **Praveena, P.**, Radwin, R., Zinn, M., Gleicher, M., & Mutlu, B. "A Method for Automated Drone Viewpoints to Support Remote Robot Manipulation." *IEEE/RSJ International Conference on Intelligent Robots and Systems.*
[P10] Human Factors '22	Ramesh, B., Konstant, A., **Praveena, P.**, Senft, E., Gleicher, M., Mutlu, B., Zinn, M., & Radwin, R.G. "Manually Acquiring Targets from Multiple Viewpoints Using Video Feedback." *Human Factors.*
[P9] HRI '22	**Praveena, P.**, Molina, L., Wang, Y., Senft, E., Mutlu, B., & Gleicher, M. "Understanding Control Frames in Multi-Camera Robot Telemanipulation." *ACM/IEEE International Conference on Human-Robot Interaction.*
[P8] HRI '20	**Praveena, P.**, Rakita, D., Mutlu, B., & Gleicher, M. "Supporting Perception of Weight through Motion-induced Sensory Conflicts in Robot Teleoperation." *ACM/IEEE International Conference on Human-Robot Interaction.* 🏅 [Best Paper Award Finalist]
[P7] ICRA '19	**Praveena, P.**, Rakita, D., Mutlu, B., & Gleicher, M. "User-Guided Offline Synthesis of Robot Arm Motion from 6-DoF Paths." *IEEE International Conference on Robotics and Automation.*
[P6] HRI '19	**Praveena, P.**, Subramani, G., Mutlu, B., & Gleicher, M. "Characterization of Input Methods for Human-to-robot Demonstrations." *ACM/IEEE International Conference on Human-Robot Interaction.*
[P5] TSP '17	Prathosh, A.P., **Praveena, P.**, Mestha, L.K., & Bharadwaj, S. "Estimation of Respiratory Pattern from Video Using Selective Ensemble Aggregation." *IEEE Transactions on Signal Processing.*
[P4] BIBE '16	Chatterjee, A., Prathosh, A.P., **Praveena, P.**, & Upadhya, V. "Real-time Visual Respiration Rate Estimation with Dynamic Scene Adaptation." *IEEE International Conference on Bioinformatics and Bioengineering.*
[P3] BIBE '16	Chatterjee, A., Prathosh, A.P., **Praveena, P.**, & Upadhya, V. "A Vision Based Method for Real-time Respiration Rate Estimation Using a Recursive Fourier Analysis." *IEEE International Conference on Bioinformatics and Bioengineering.*
[P2] BIBE '16	Upadhya, V., Chatterjee, A., Prathosh, A.P., & **Praveena, P.** "Respiration Monitoring through Thoraco-Abdominal Video with an LSTM." *IEEE International Conference on Bioinformatics and Bioengineering.*
[P1] EMBC '16	Chatterjee, A., Prathosh, A.P., & **Praveena, P.** "Real-time Respiration Rate Measurement from Thoracoabdominal Movement with a Consumer Grade Camera." *IEEE International Conference of the Engineering in Medicine and Biology Society.*

JURIED SHORT CONFERENCE PAPERS/WORKSHOP PAPERS/EXTENDED ABSTRACTS

[S8] AAAI FSS '24	Zhou, Z., Jin, Y., & **Praveena, P.** "Statewise: A Petri Net-Based Visual Editor for Specifying Robotic Systems." *AAAI Fall Symposium on Unifying Representations for Robot Application Development.* 🏅 [Best Paper Award]
[S7] UIST '24	**Praveena, P.**, Sato, A. J., Koike, A., Zhou, R., White, N. T., & Nakagaki, K. "HRI and UIST: Designing Socially Engaging Robot Interfaces." *Adjunct Proceedings of the 37th Annual ACM Symposium on User Interface Software and Technology.*

[S6] HRI '24	<u>Hwang, Y.</u>, Sato, A. J., **Praveena, P.**, White, N. T., & Mutlu, B. "Understanding Generative AI in Robot Logic Parametrization." *Workshop at ACM/IEEE International Conference on Human-Robot Interaction on End-User Development for Human-Robot Interaction.*
[S5] AAAI FSS '23	**Praveena, P.**, Schoen, A., Gleicher, M., Porfirio, D., & Mutlu, B. "Petri Nets for the Iterative Development of Interactive Robotic Systems." *AAAI Fall Symposium on Unifying Representations for Robot Application Development.*
[S4] CSCW '23	<u>Meng, H.</u>, Wang, Y., **Praveena, P.**, Gleicher, M., & Mutlu, B. "Demonstrating Periscope: A Robotic Camera System to Support Remote Physical Collaboration." *Demonstration at ACM Conference On Computer-Supported Cooperative Work and Social Computing.*
[S3] CHI '23	**Praveena, P.***, Cagiltay, B.*, Gleicher, M., & Mutlu, B. "Exploring the Use of Collaborative Robots in Cinematography." *Late-Breaking Work at ACM Conference on Human Factors in Computing Systems.* 🏅 [ACM SIGCHI Gary Marsden Travel Award]
[S2] HRI '23	**Praveena, P.**, Gleicher, M., & Mutlu, B. "Designing Robotic Camera Systems to Enable Synchronous Remote Collaboration." *Extended Abstract at ACM/IEEE International Conference on Human-Robot Interaction.* 🏅 [HRI Pioneer]
[S1] RSS '20	**Praveena, P.**, Mutlu, B., & Gleicher, M. "Human-Robot Interfaces for Physical Interactions." *Extended Abstract at Robotics: Science and Systems.* 🏅 [RSS Pioneer]

PATENTS

[P2] "System and method for extracting a periodic signal from video." 2019. US Patent 10,192,307.

[P1] "Determining respiration rate from a video of a subject breathing." 2018. US Patent 9,861,302.

MENTORING

I have mentored 40+ students (PhD, MS, BS) across UW–Madison and CMU.

GRADUATE STUDENTS

2023 — 2025	**Nathan White**	PhD CS UW–Madison
2023 — 2024	**Yaxin Hu**	PhD CS UW–Madison
2023 — 2024	**Dakota Sullivan**	PhD CS UW–Madison
2023 — 2024	**Yuna Hwang**	PhD CS UW–Madison
2023 — 2024	**Christine Lee**	PhD CS UW–Madison
2022 — 2023	**Yeping Wang**	PhD CS UW–Madison
2025 — Present	**Sarah Lim**	METALS HCII CMU
2023 — Present	**Zejun Zhou**	MS CS Brown University, BS CS UW–Madison
2024 — 2025	**Nikhil Kruthiventi**	MS CS UW–Madison, BS CS UW–Madison

UNDERGRADUATE STUDENTS

2025 — Present	**Stella Chen**	BS Neuroscience CMU
2025 — Present	**Zhaowei Zhang**	BS CS CMU
2025 — Present	**Unmesh Chakravarty**	BS CS CMU
2025 — Present	**Avantika Gupta**	BS CS CMU
2025 — Present	**Preetham Manapuri**	BS CS CMU
2025	**Rebecca Wang**	BS Mathematical Sciences CMU

2025	**Cyprien Riboud-Seydoux**	BS CS CMU
2025	**Jasmine Xu**	BS CS CMU
2025	**Sofian Syed**	BS CS CMU
2024	**Glenda Tan**	BS CS CMU
2024	**Pranavi Kondapalli**	BS CS CMU
2024	**Ryan Ding**	BS CS CMU
2024	**Jessica Han**	BS CS CMU
2024	**Taenam Kim**	BS CS UW–Madison
2023 — 2024	**Rainy Jin**	BS CS UW–Madison
2023 — 2024	**Sydney Scalzo**	BS CS UW–Madison
2022 — 2023	**Haoming Meng**	BS CS UW–Madison
2022	**Lily Reback**	BS Psychology UW–Madison
2022	**Alexander Peseckis**	BS CS UW–Madison
2022	**William Cong**	BS CS UW–Madison
2021 — 2022	**Gia-phong Nguyen**	BS CS UW–Madison
2021 — 2022	**Sage Livingstone**	BS CS UW–Madison
2020 — 2021	**Luis Molina**	Research Staff UW–Madison
2019 — 2020	**Jack Yang**	BS CS UW–Madison
2019 — 2020	**Sayem Wani**	BS CS UW–Madison
2019 — 2020	**Joshua Mathews**	BS CS UW–Madison

PEER MENTORING

I organized a peer mentorship program for 16 months in which 2–3 graduate students met with a different student mentor each week. Through this program, I provided peer mentorship to 12 graduate students through weekly sessions.

2022 — 2023	**People and Robots Lab**, UW–Madison
	Mentees: Yuna Hwang, Hailey Johnson, Amy Koike, Callie Kim, Christine Lee, Dakota Sullivan, Irene Ho, Bengisu Cagiltay, Yaxin Hu, Nathan White, Nitzan Orr, Kevin Welsh

TEACHING EXPERIENCE

I have guest lectured in HRI, served as TA for a core ECE course, and led technical design workshops.

Fall 2025	**Guest Lecturer**, Introduction to HRI, CMU *(Upcoming)* *Interactive session on HRI for 10 graduate students; IoR: Henny Admoni*
Fall 2025	**Guest Lecturer**, Robotics for Creative Practice, CMU *Interactive session on HRI for 10 undergraduate students; IoR: Garth Zeglin*
Fall 2024	**Instructor**, HRI x UIST: Designing Socially Engaging Robot Interfaces, UIST @ CMU *Interactive full-day workshop on HRI for ~20 participants*
Summers 2018, 2019	**Guest Lecturer**, Social Robotics, Grandparents University, UW–Madison *Lecture + lab session for ~20 children and grandparents; modernized lab component*
Fall 2017	**Teaching Assistant**, ECE 203: Signals, Information and Computation, UW–Madison *Flipped-classroom instruction, office hours, and online Q&A support for ~200 students*
2014 — 2015	**President and Instructor**, Web Operations Club, Centre for Innovation, IIT Madras *Year-long series of workshops, multi-day camps, and hackathons for 400+ students*

INVITED TALKS

2025	Robotics Seminar, **Cornell University** *(Upcoming)*
2024	**Talking Robotics** YouTube Seminar *(Virtual)*
2024	Institute for Experiential Robotics Seminar Series, **Northeastern University**
2024	HRI Reading Group, **Tufts University**
2023	Adaptive Systems Section, **Naval Research Laboratory**
2023	Intuitive Computing Lab, **Johns Hopkins University**
2023	CS Departmental Research Symposium, **UW–Madison** 🏅 [Best Talk Award]
2021	LUCID Seminar, **UW–Madison** *(Virtual)*

ACADEMIC SERVICE

PROGRAM COMMITTEE

2025	Computer-Supported Cooperative Work & Social Computing (CSCW) 🏅 [Special Recognition]
2024	Pioneers Workshop at ACM/IEEE International Conference on Human-Robot Interaction (HRI)

REFEREE SERVICE

2021 — 2025	ACM/IEEE International Conference on Human-Robot Interaction (HRI)
2023 — 2025	ACM Conference on Human Factors in Computing Systems (CHI)
2023, 2025	Transactions on Human-Robot Interaction (THRI)
2025	ACM Symposium on User Interface Software and Technology (UIST)
2024	ACM Conference on Designing Interactive Systems (DIS) 🏅 [Special Recognition]
2023	Computer-Supported Cooperative Work & Social Computing (CSCW)

Ad-hoc Reviewer

2024	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
2023	Automation in Construction
2022	IEEE Robotics and Automation Letters (RA-L)

ORGANIZATION

2024	**Co-chair**, AAAI Fall Symposium on AI for Aging in Place, Arlington, VA, USA *Organized a 2.5-day multidisciplinary symposium*
2024	**Lead Organizer**, HRI x UIST: Designing Socially Engaging Robot Interfaces, Pittsburgh, PA, USA *Organized a full-day interactive workshop on social robotics*
2024	**Networking Chair**, HRI Pioneers Workshop, Boulder, CO, USA *Initiated the mentorship program*
2021	**Social Chair**, RSS Pioneers Workshop, Virtual *Organized social activities on Gather.town*

OUTREACH/VOLUNTEERING

2024	**Judge**, FIRST LEGO League, Aliquippa High School, PA, USA
2023	**Staff**, UW–Madison CS recruitment booth, Grace Hopper Celebration, Orlando, FL, USA
Summer 2022	**Co-organizer**, Human–Centered Computing Reading Group, UW–Madison
2018 — 2023	**Volunteer**, Lab tours & demos for visiting school children, graduate students, & faculty candidates

EXTRA-CURRICULAR

2019 **Morgridge Entrepreneurial Bootcamp**, UW–Madison
Selected to attend a one-week training program in technology entrepreneurship for graduate students

2018 **gALPHA Entrepreneurship Program**, UW–Madison
Selected to attend a four-week venture-creation program by *gener8tor*, a nationally ranked accelerator

2018 **Hackathon winner** *(#1 in 8 teams)*, EnerHack, UW–Madison

2014 **Hackathon winner** *(#1 in ~20 teams)*, Geek Up, IIT Madras; Invited to present at Google DevFest, Chennai