

PRAGATHI PRAVEENA

GROUP-CENTERED AI & ROBOTICS RESEARCHER

Robotics Institute, Carnegie Mellon University
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RESEARCH OVERVIEW

I am a **group-centered AI and robotics researcher**. My research focuses on designing and studying AI systems for groups, including how these systems reshape the dynamics of the groups in which they are embedded. Creating effective AI for groups requires new methods for human-centered design and evaluation at the group level, because **collective outcomes are emergent properties** that cannot be reduced to the experiences of individual members alone. Group-centered AI matters because groups are fundamental to human thriving, and we need productive and responsible ways for AI and robots to participate in them.

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, Michael Gleicher, 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 (<i>top 5%</i>), 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 (<i>top 3 in ~800 graduates</i>), IIT Madras Motorola Prize (<i>#1 in ~150 EE and CS graduates</i>), 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 interdisciplinary research project on social world modeling to enable AI social reasoning
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 <i>Patents licensed by a California-based baby monitor startup</i>
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 robotics and HCI; * indicates equal contribution, indicates students I mentored.

IN PREPARATION/UNDER REVIEW

<i>In Preparation</i>	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. “AI Getting to Know You: Understanding Users via LLM-based Narrative Analysis.”
<i>In Preparation</i>	Tan, G. H.*, Han, J.* , Kondapalli, P.* , Ding, R.* , Puthuveetil, K., Tecson, M., Praveena, P. , Erickson Z., & Simmons, R. “Vision and Tracking in a Smart AI Kitchen for Older Adults.”
<i>Under Review</i>	<u>White, N. T.</u> , Praveena, P. , <u>Kruthiventi, N.</u> , & Mutlu, B. “Exploring the Potential of Multimodal LLMs for the Understanding of Qualitative Data.”
<i>In Preparation</i>	Sheidlower, I., Bu, F., Muslimani, C., Zhu, Y., Praveena, P. , & Booth, S. “Robot Lending Libraries: Empowering Society with Robots as Public Goods.”

JOURNAL ARTICLES/REFEREED FULL CONFERENCE PAPERS

[P16] UIST ‘25	Hu, Y., Sato, A. J., Du, J., Ye, C., Zhu, A., Praveena, P. , & Mutlu, B. “Narraguide: an LLM-based Narrative Mobile Robot for Remote Place Exploration.” <i>ACM Symposium on User Interface Software and Technology</i> .
[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
Wang, Y., **Praveena, P.**, & Gleicher, M. "A Design Space of Control Coordinate Systems in Telemanipulation." *IEEE Access*.
- [P13] *CSCW '23*
Praveena, P., Wang, Y., 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.**, & Upadhyay, 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.**, & Upadhyay, 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*
Upadhyay, 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 Hwang, Y., 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 Meng, H., 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

- [T2] "System and method for extracting a periodic signal from video." 2019. US Patent 10,192,307.
[T1] "Determining respiration rate from a video of a subject breathing." 2018. US Patent 9,861,302.

TEACHING EXPERIENCE

I have guest lectured in HRI (delivering original lesson plans), served as TA for a core ECE course, and led technical design workshops.

- Fall 2025 **Guest Lecturer**, Introduction to HRI, CMU
Two interactive sessions on HRI for ~10 graduate students
- Fall 2025 **Guest Lecturer**, Robotics for Creative Practice, CMU
Interactive session on HRI for ~10 undergraduate students
- 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 sessions 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

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	Yixin 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	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	Sude Ozkaya	BS Cognitive Science CMU
2025 – Present	Yudh Shukla	BS Cognitive Science CMU
2025 – Present	Stella Chen	BS Neuroscience CMU
2025 – Present	Zhaowei Zhang	BS CS CMU
2025 – Present	Avantika Gupta	BS CS CMU
2025	Unmesh Chakravarty	BS CS CMU
2025	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, Yixin Hu, Nathan White, Nitzan Orr, Kevin Welsh
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INVITED TALKS

2025	Robotics Seminar, Cornell University
2024	Talking Robotics YouTube Seminar (<i>Virtual</i>)
2024	Robotics Seminar, 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 (<i>Virtual</i>)

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 — 2026	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 <i>Organized a 2.5-day multidisciplinary symposium</i>
2024	Lead Organizer , HRI x UIST: Designing Socially Engaging Robot Interfaces, Pittsburgh, PA, USA <i>Organized a full-day interactive workshop on social robotics</i>

- 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