PRAGATHI PRAVEENA

HUMAN-COMPUTER AND HUMAN-ROBOT INTERACTION RESEARCHER

Robotics Institute, Carnegie Mellon University
4804 Forbes Avenue, Pittsburgh, PA 15213
Email: pragathi@cmu.edu | Website: pragathipraveena.com | LinkedIn: itispragathi | Twitter: @itispragathi | she/her/hers

RESEARCH OVERVIEW

I am interested in developing novel interactive systems, particularly **collaborative systems** that leverage advancements in robotics and AI to facilitate human-human interactions. My work draws on methods and concepts from Human-Computer Interaction (HCI), Human-Robot Interaction (HRI), and Computer-Supported Cooperative Work (CSCW) to develop complex interactive systems that embody my research ideas and enable empirical investigations. Additionally, I am interested in the creation of **enabling resources**, such as datasets, tools, libraries, and languages, to support the development of future interactive systems.

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

2023 **Sub-award from NASA University Leadership Initiative**, 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
2024 **Special Recognition for Outstanding Review**
ACM Conference on Designing Interactive Systems (DIS)
ACM SIGCHI Conference on Computer-Supported Cooperative Work & Social Computing (CSCW)

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**
	NSF AI Institute for Collaborative Assistance and Responsive Interaction for Networked Groups
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
	Expanded a grant's original scope by initiating a new research direction that combined HRI & CSCW
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

† indicates equal contribution   • indicates students I mentored

JOURNAL ARTICLES

[J4] IEEE Access '24	• Wang, Y., **Praveena, P.**, & Gleicher, M. "A Design Space of Control Coordinate Systems in Telemanipulation." *IEEE Access.*
[J3] 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).
[J2] 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.*
[J1] 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.*

REFEREED FULL CONFERENCE PAPERS

[C11] DIS '24 • Lee, C. P., **Praveena, P.**, & Mutlu, B. "Designing User-centered Repair and Explanations to Address Robot Failures." *ACM Conference on Designing Interactive Systems.*

[C10] 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.*

[C9] 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.*

[C8] 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.*

[C7] 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]

[C6] 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.*

[C5] 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.*

[C4] 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.*

[C3] 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.*

[C2] 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.*

[C1] 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

[S7] 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]

[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]

OTHER PUBLICATIONS

[M2] HCIC '18	**Praveena, P.**, Mutlu, B., & Gleicher, M. "Communicating Physical Interactions to Robots." *Human–Computer Interaction Consortium Workshop: AI and HCI.*
[M1] BEATS '14	**Praveena, P.**, Kavalam, J., & Jacob, N. "A smartphone-based vision simulator." *International Conference on Biomedical Engineering and Assistive Technologies.*

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.

TEACHING EXPERIENCE

Summers 2018, 2019	**Social Robotics Instructor,** Grandparents University, UW–Madison Co-designed and co-taught lecture and lab session for children and their grandparents
Fall 2017	**Teaching Assistant**, ECE 203: Signals, Information and Computation, UW–Madison Co-taught in a flipped classroom, held office hours, managed online Q&A for ~200 students
2014 — 2015	**President and Instructor**, Web Operations Club, Centre for Innovation, IIT Madras Co-organized introductory and advanced sessions for 400+ students on web development Taught graphics editing and design thinking to 100+ students for web & app development

MENTORING

PHD STUDENTS

People and Robots Lab, UW–Madison (Advised jointly w/ Bilge Mutlu)

2023 — Present	**Nathan White**
2023 — 2024	**Yaxin Hu**
2023 — 2024	**Dakota Sullivan**
2023 — 2024	**Yuna Hwang**; Paper: S6
2023 — 2024	**Christine Lee**; Paper: C11

Graphics Lab, UW–Madison (Advised jointly w/ Michael Gleicher)

2022 — 2023	**Yeping Wang**; Paper: C10, J4

RESEARCH STAFF, UW–Madison

2020 — 2021   **Luis Molina**; Paper: C8

UNDERGRADUATE STUDENTS

RASL/HARP Lab, CMU (Advised solely)

2025 — Present   **Unmesh Chakravarty**
2025 — Present   **Avantika Gupta**
2025 — Present   **Sofian Syed**
2025 — Present   **Preetham Manapuri**

RASL Lab, CMU (Advised jointly w/ Reid Simmons and Zackory Erickson)

2024   **Glenda Tan**
2024   **Pranavi Kondapalli**
2024   **Ryan Ding**
2024   **Jessica Han**

People and Robots Lab, UW–Madison (Advised solely or jointly w/ graduate student)

2024 — Present   **Nikhil Kruthiventi** *(w/ Nathan White)*
2024   **Taenam Kim** *(w/ Nathan White)*
2023 — 2024   **Rainy Jin**; Paper: S7
2023 — Present   **Zejun Zhou**; Paper: S7
2023 — 2024   **Sydney Scalzo**
2022 — 2023   **Haoming Meng** *(w/ Yeping Wang)*; Paper: S4
2022   **Lily Reback**

Graphics Lab, UW–Madison (Advised jointly w/ Michael Gleicher)

2022   **Alexander Peseckis**
2022   **William Cong**
2021 — 2022   **Gia-phong Nguyen**
2021 — 2022   **Sage Livingstone**
2019 — 2020   **Jack Yang**
2019 — 2020   **Sayem Wani**
2019 — 2020   **Joshua Mathews**

PEER MENTORING

People and Robots Lab, UW–Madison

April 2022 — August 2023

I organized a peer mentorship program 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**.

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

INVITED TALKS

October 2024	Institute for Experiential Robotics, **Northeastern University**, Boston, MA, USA | *Host:* Zhi Tan
	"Robots for teams: Insights from designing the Periscope system to support remote collaboration"
October 2024	HRI Reading Group, **Tufts University**, Medford, MA, USA | *Host:* Reuben Aronson
	"Robots for teams: Insights from designing the Periscope system to support remote collaboration"
October 2023	Adaptive Systems Section, **Naval Research Laboratory**, Washington, DC, USA | *Host:* Laura Hiatt
	"Supporting remote human collaboration for physical tasks through robotic cameras"
October 2023	Intuitive Computing Lab, **Johns Hopkins University**, Baltimore, MD, USA | *Host:* Chien-Ming Huang
	"Supporting remote human collaboration for physical tasks through robotic cameras"
April 2023	CS Departmental Research Symposium, **UW–Madison**, Madison, WI, USA 🏅 [Best Talk Award]
	"Designing robotic camera systems to enable synchronous remote collaboration"
April 2021	LUCID Seminar, **UW–Madison**, Madison, WI, USA [Virtual]
	"Visual awareness in remote environments"

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)
2024	ACM Conference on Designing Interactive Systems (DIS) 🏅 [Special Recognition]
2023	Computer-Supported Cooperative Work & Social Computing (CSCW)

Ad-hoc Reviewer

2023, 2025	Transactions on Human-Robot Interaction
2024	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
2023	AAAI Fall Symposium on Unifying Representations for Robot Application Development
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 two and one-half day multidisciplinary symposium
2024	**Lead Organizer**, HRI x UIST: Designing Socially Engaging Robot Interfaces, Pittsburgh, PA, USA
	Led an interactive workshop centered on social robotics
2024	**Panel/Networking Chair**, Pioneers Workshop at HRI, Boulder, CO, USA
	Initiated the HRI Pioneers mentorship program
2021	**Local/Social Chair**, Pioneers Workshop at RSS, Virtual

OUTREACH

2023	**Staff**, UW–Madison CS recruitment booth, Grace Hopper Celebration, Orlando, FL, USA
Summer 2022	**Organizer** (along with Yaxin Hu), 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