

# PRAGATHI PRAVEENA

## HUMAN-COMPUTER AND HUMAN-ROBOT INTERACTION RESEARCHER

Department of Computer Sciences, University of Wisconsin–Madison

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## RESEARCH INTERESTS

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I have 8+ years of experience prototyping interactive systems and studying user interactions with them using both quantitative and qualitative methods. My research interests include human-centered robotics, robotic cameras, mixed-initiative systems, and computer-supported collaborative work.

## EDUCATION

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2017—Dec 2023 **MS and PhD in Computer Science**, University of Wisconsin—Madison, USA  
(expected) Advisors: Dr. Bilge Mutlu and Dr. Michael Gleicher

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

## WORK & RESEARCH EXPERIENCE

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2017—Present **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*

2014—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

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See my [Google Scholar](#) and [ResearchGate](#) profiles for an up-to-date list of my publications and links to papers.

\* indicates equal contribution

### JOURNAL ARTICLES

- [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 (PACM-HCI), Track: Computer-Supported Cooperative Work and Social Computing.  
*ORAL PRESENTATION AT MINNEAPOLIS, MN, USA*
- [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. (Impact factor: 3.6)
- [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. (Impact factor: 4.9)

## REFEREED FULL CONFERENCE PAPERS

- [C10] ICRA '23 Wang, Y., **Praveena, P.**, Rakita, D., and 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. (58/234 = 25% acceptance rate) *ONLINE ORAL PRESENTATION*
- [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. (67/279 = 24% acceptance rate) *ONLINE ORAL PRESENTATION*  
**[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. (48/201 = 24% acceptance rate) *ORAL PRESENTATION AT DAEGU, SOUTH KOREA*
- [C4] 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.
- [C3] 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.
- [C2] 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.
- [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. *POSTER PRESENTATION AT ORLANDO, FL, USA*

## REFEREED EXTENDED ABSTRACTS

- [S2] CSCW '23 Meng, H., Wang, Y., **Praveena, P.**, Gleicher, M., & Mutlu, B. "Demonstrating Periscope: A Robotic Camera System to Support Remote Physical Collaboration." ACM Conference On Computer-Supported Cooperative Work and Social Computing. *DEMO AT MINNEAPOLIS, MN, USA*
- [S1] CHI '23 **Praveena, P.\***, Cagiltay, B.\*, Gleicher, M., & Mutlu, B. "Exploring the Use of Collaborative Robots in Cinematography." ACM Conference on Human Factors in Computing Systems. (330/968 = 34% acceptance rate) *POSTER PRESENTATION AT HAMBURG, GERMANY*  
**[ACM SIGCHI Gary Marsden Travel Award]**

## DOCTORAL CONSORTIA

- [DC2] HRI '23 **Praveena, P.**, Gleicher, M., & Mutlu, B. "Designing Robotic Camera Systems to Enable Synchronous Remote Collaboration." ACM/IEEE International Conference on Human-Robot Interaction. (19/75 = 25% acceptance rate) *POSTER PRESENTATION AT STOCKHOLM, SWEDEN*
- [DC1] RSS '20 **Praveena, P.**, Mutlu, B., & Gleicher, M. "Human-Robot Interfaces for Physical Interactions." Robotics: Science and Systems. (28/88 = 32% acceptance rate) *ONLINE ORAL PRESENTATION*

## OTHER PUBLICATIONS

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

## 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.

## RESEARCH GRANTS

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### CO-AUTHORED

**Expanding Our Vision Award**, McPherson Eye Research Institute, UW-Madison  
"Designing Interfaces to Enhance the Experience of Remote Vision through Robotic Cameras"  
**Investigator:** Bilge Mutlu (PI); **Period:** 2023-2024; **Amount:** \$10,000

## HONORS & AWARDS

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- 2023 **ACM SIGCHI Gary Marsden Travel Award**, Full support of \$2200 for travel to CHI (Hamburg, Germany)
- 2023 **HRI Pioneer**, Funded participant in selective doctoral consortium (25% acceptance) at HRI (Stockholm, Sweden)
- 2020 **RSS Pioneer**, Funded participant in selective doctoral consortium (32% acceptance) at RSS (virtual)
- 2020 **Best Paper Award Finalist** (top 5%), ACM/IEEE Human-Robot Interaction (HRI)
- 2016 **Xerox Patent Award**, Awarded by Xerox Co. to the lead inventor on a filed patent
- 2015 **Institute Blues** (top 3 in ~800 graduates) and **Motorola prize** (#1 in ~150 EE and CS graduates)  
Recognized for exceptional overall achievement during undergraduate studies at IIT Madras
- 2014 **French Government Charnpak Scholarship**, 2 months research support at ENS, Paris

## MENTORING

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### PHD STUDENTS, UW-Madison

- 2023—Present **Yuna Hwang**, Expressive robot motion generation using natural language
- 2023—Present **Christine Lee**, Explanations for unexpected robot behavior and program repair
- 2022—2023 **Yeping Wang**, Robot motion generation for ranged-goal tasks; **Paper:** C10

### PRE-DOCTORAL TRAINEES, UW-Madison

- 2020—2021 **Luis Molina**, Multi-camera interface for robot telemanipulation; **Paper:** C8

## UNDERGRADUATE STUDENTS, UW–Madison

2022—2023	<b>Haoming Meng</b> , Web interface for robot-supported collaboration; <b>Paper:</b> S2
2022	<b>Lily Reback</b> , Qualitative coding of multi-modal data
2022	<b>Alexander Peseckis</b> , Web-based robot motion viewer
2022	<b>William Cong</b> , VR platform for robot experiments
2021—2022	<b>Gia-phong Nguyen</b> , Web-based robot motion viewer
2021—2022	<b>Sage Livingstone</b> , Blender plugin for creating models of robots and scenes
2019—2020	<b>Jack Yang</b> , VR platform for robot experiments
2019—2020	<b>Sayem Wani</b> , Web interface for MOVO, a mobile bi-manual manipulator robot
2019—2020	<b>Joshua Mathews</b> , Control system for MOVO, a mobile bi-manual manipulator robot

## PEER MENTORING, UW–Madison

(April 2022—Present) I structured and executed a peer mentorship program in the People and Robots lab in which 2–3 graduate students meet with a different student mentor each week (original concept by Bengisu Cagiltay). Through this program, I provide peer mentorship to 12 graduate students across various sub-disciplines in HCI including HRI, assistive technology, and interaction design through **weekly sessions**.

**Current Mentees:** Yuna Hwang, Hailey Johnson, Amy Koike, Callie Kim, Nitzan Orr, Christine Lee, Dakota Sullivan, Irene Ho, Bengisu Cagiltay, Yaxin Hu, Laura Stegner, Nathan White

**Past Mentees:** Kevin Welsh

## TEACHING EXPERIENCE

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Summers 2018, 2019	<b>Social Robotics Instructor</b> , Grandparents University, UW–Madison Co-designed and co-taught lecture and lab session for children and their grandparents
Fall 2017	<b>Teaching Assistant</b> , 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	<b>President and Tutor</b> , 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

## ACADEMIC SERVICE

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### REVIEWING

2023	Automation in Construction
2023	Proceedings of the ACM on Human-Computer Interaction (PACM-HCI: CSCW)
2023	ACM Conference on Human Factors in Computing Systems (CHI)
2022	IEEE Robotics and Automation Letters (RA-L)
2022	IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
2021—2023	ACM/IEEE International Conference on Human-Robot Interaction (HRI)

### ORGANIZATION

2024	<b>Panel Chair</b> , Pioneers Workshop at HRI, Boulder, CO, USA
2021	<b>Local Chair</b> , Pioneers Workshop at RSS, Virtual

## OUTREACH

- 2023 **Staff**, UW–Madison CS recruitment booth, Grace Hopper Celebration, Orlando, FL, USA
- 2023 **Speaker**, CS Departmental Research Symposium, UW–Madison  
*“Designing Robotic Camera Systems to Enable Synchronous Remote Collaboration”*  
**[Best Talk Award - Top 2 in 14]**
- 2023 **Volunteer**, Demos in the lab for 60 students from La Follete High School, Madison, WI, USA
- 2022 **Organizer** (along with Yaxin Hu), Human-Centered Computing Meetup

## EXTRA-CURRICULAR

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- 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