

# Amama Mahmood

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## Research Overview

My research, situated at the intersection of HCI and Health, focuses on enhancing human-machine interactions to support health and well-being. Specifically, I design, develop, and evaluate AI assistants-powered by LLMs that enable seamless, adaptive interactions by understanding user behaviors in various real-world contexts. With a focus on empowering older adults in managing their health to facilitate aging in place, my work emphasizes situated, long-term, sustainable, "in the wild" human-machine interactions.

**Keywords:** *Human-Computer Interaction, Human-AI Interaction, Human-Robot Interaction, Conversational Agents, Large Language Models, Human-Subjects Research, Health*

## Current Position

**Postdoctoral Fellow**, Johns Hopkins Malone Center for Engineering in Healthcare      **September 2025 — Present**

- Advised by Dr. **Chien-Ming Huang, Ziang Xiao, and Paul Yi**

## Education

<b>Doctor of Philosophy in Computer Science</b> , <i>Johns Hopkins University</i>	<b>2020—2025</b>
<ul style="list-style-type: none"><li>Advised by Dr. <b>Chien-Ming Huang</b>.</li></ul>	
<b>Master of Science in Engineering (Computer Science)</b> , <i>Johns Hopkins University</i>	<b>2020—2022</b>
<b>Master of Science in Engineering (Robotics)</b> , <i>Johns Hopkins University</i>	<b>2018—2020</b>
<b>Bachelor in Electrical Engineering</b> , <i>National University of Sciences &amp; Technology (NUST)</i> .	<b>2013—2017</b>

## Research/Work Experience

<b>Graduate Research Assistant</b> , <i>Johns Hopkins University</i>	<b>2019—2020</b>
<b>Research Assistant</b> , <i>Satellite Servicing Mission NASA Project-Johns Hopkins University</i>	<b>2019—2020</b>
<b>Research Assistant</b> , <i>Signal, Image and Video Processing lab, LUMS, Pakistan</i>	<b>2017—2018</b>
<b>Undergraduate Researcher</b> , <i>National University of Sciences and Technology, Pakistan</i>	<b>2016 —2017</b>

## Honors/Awards

<b>Malone Postdoctoral Fellowship</b> , <i>Johns Hopkins University</i>	<b>2025—2026</b>
<b>Creel Family Engineering Fellowship</b> , <i>Johns Hopkins University</i>	<b>2020—2021</b>
<b>Computer Science Department Fellowship</b> , <i>Johns Hopkins University</i>	<b>2020—2021</b>
<b>Fulbright Scholar</b>	<b>2018—2020</b>

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**In Preparation or Under Review Manuscripts****M.3 From Text to Conversation: Evaluating an LLM-Powered Voice Assistant for Sleep Diary Intake Through a Month-Long Deployment**

Amama Mahmood\*, Bokyung Kim\*, Honghao Zhao, Molly Atwood, Luis Buenaver, Michael Smith, Chien-Ming Huang  
[In preparation] (2026)

**M.2 Re-imagining Behavioral Sleep Medicine: Designing Conversational Sleep Diary and Visualization Tool**

Amama Mahmood, Bokyung Kim, Honghao Zhao, Molly Atwood, Luis Buenaver, Michael Smith, Chien-Ming Huang  
[Under review, [arXiv](#)] (2026)

**M.1 "You Might Like It": How People Respond to Small Talk in Human-Robot Collaboration**

Kaitlynn Taylor Pineda, Amama Mahmood, and Chien-Ming Huang  
[Under review, [arXiv](#)] (2024)

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**Peer-Reviewed Journal Articles****J.7 Situated Understanding of Errors in Older Adults' Interactions with Voice Assistants: A Month-Long, In-Home Study**

Amama Mahmood, Junxiang Wang, and Chien-Ming Huang  
*Proceedings of ACM Transactions on Accessible Computing (TACCESS)* (2026) [Accepted. [arXiv](#)]

**J.6 "Mango Mango, How to Let The Lettuce Dry Without A Spinner?": Exploring User Perceptions of Using An LLM-Based Conversational Assistant Toward Cooking Partner**

Szeyi Chan, Jiachen Li, Bingsheng Yao, Amama Mahmood, Chien-Ming Huang, Holly Jimison, Elizabeth D. Mynatt, and Dakuo Wang  
*Proceedings of the ACM on Human-Computer Interaction (CSCW)* (2025)  
Volume 9, no. 7 <https://doi.org/10.1145/3757442>

**J.5 User Interaction Patterns and Breakdowns in Conversing with LLM-powered Voice Assistants**

Amama Mahmood, Junxiang Wang, Bingsheng Yao, Dakuo Wang, and Chien-Ming Huang  
*International Journal of Human-Computer Studies (IJHCS)* (2025)  
Volume 195 <https://doi.org/10.1016/j.ijhcs.2024.103406>

**J.4 Care to Explain? AI Explanation Types Differentially Impact Physician Diagnostic Performance and Trust in AI**

Drew Prinster\*, Amama Mahmood\*, Suchi Saria, Jean Jeudy, Cheng Ting Lin, Paul Yi, and Chien-Ming Huang  
*Radiology* (2024)  
Volume 313, Issue 2 <https://doi.org/10.1148/radiol.233261>

**J.3 Gender Biases in Error Mitigation by Voice Assistants**

Amama Mahmood and Chien-Ming Huang  
*Proceedings of the ACM on Human-Computer Interaction (CSCW)* (2024)  
Volume 8, Issue CSCW1, Article 60, Pages 1–27 <https://doi.org/10.1145/3637337>

**J.2 Crowdsourcing Thumbnail Captions: Data Collection and Validation**

Carlos Aguirre\*, Shiye Cao\*, Amama Mahmood, and Chien-Ming  
*ACM Transactions on Interactive Intelligent Systems (TIIS)* (2023)  
Volume 13, Issue 3, Article 14, Pages 1–28 <https://doi.org/10.1145/3589346>, Invited article following IUI'22 (C.4)

**J.1 SmartSIM-A Virtual Reality Simulator for Laparoscopy Training Using a Generic Physics Engine**

Zohaib Amjad Khan, Nabeel Kamal, Asad Hameed, Amama Mahmood, Rida Zainab, Bushra Sadia, Shamyil Bin Mansoor, and Osman Hasan  
*The International Journal of Medical Robotics and Computer Assisted Surgery* (2017)  
Volume 13, Issue 3, Pages e1771 <https://doi.org/10.1002/rcs.1771>

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**Peer-Reviewed Conference Full Papers****C.8 ERR@ HRI 2.0 Challenge: Multimodal Detection of Errors and Failures in Human-Robot Conversations**

Shiye Cao, Maia Stiber, Amama Mahmood, Maria T. Parreira, Wendy Ju, Micol Spitale, Hatice Gunes, Chien-Ming Huang  
*Proceedings of the 33<sup>rd</sup> ACM International Conference on Multimedia (ACM-MM)* (2025) (Short paper)  
Pages = 14130–14135 <https://doi.org/10.1145/3746027.3762073>

## C.7 Interruption Handling for Conversational Robots

Sally Cao, Jiwon Moon, Amama Mahmood, Victor Antony, Ziang Xiao, Anqi Liu, and Chien-Ming Huang  
*Proceedings of the 2025 Robotics: Science and Systems Conference (RSS)* (2025)  
<https://doi.org/10.48550/arXiv.2501.01568> | Acceptance rate: 27.4%

## C.6 Voice Assistants for Health Self-Management: Designing for and with Older Adults

Amama Mahmood, Shiye Cao, Maia Stiber, Victor Antony, and Chien-Ming Huang  
*Proceedings of 2025 ACM Conference on Human Factors in Computing Systems (CHI)* (2025)  
<https://doi.org/10.48550/arXiv.2409.15488> | Acceptance rate: 25.1%

## C.5 Effects of Rhetorical Strategies and Skin Tones on Agent Persuasiveness in Assisted Decision-Making

Amama Mahmood and Chien-Ming Huang  
*Proceedings of 2022 ACM International Conference on Intelligent Virtual Agents (IVA)* (2022)  
Article 7, Pages 1–8 <https://doi.org/10.1145/3514197.3549628>

## C.4 Crowdsourcing Thumbnail Captions Using Time-Constrained Methods

Carlos A Aguirre, Amama Mahmood, and Chien-Ming  
*Proceedings of the 2022 ACM International Conference on Intelligent User Interface (IUI)* (2022)  
Pages 36–48 <https://doi.org/10.1145/3490099.3511136> | Acceptance rate: 24.5%

## C.3 Owning Mistakes Sincerely: Strategies for Mitigating AI Errors

Amama Mahmood, Jeanie W Fung, Isabel Won, and Chien-Ming Huang  
*Proceedings of the 2022 ACM Conference on Human Factors in Computing Systems (CHI)* (2022)  
Article 578, Pages 1–11 <https://doi.org/10.1145/3491102.3517565> | Acceptance rate: 24.7%

## C.2 Visual Monitoring and Servoing of a Cutting Blade during Telerobotic Satellite Servicing

Amama Mahmood, Balazs P Vagvolgyi, Will Pryor, Louis L Whitcomb, Peter Kazanzides, and Simon Leonard  
*IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* (2020)  
Pages 1903–1908 <https://doi.org/10.1109/IROS45743.2020.9341485>

## C.1 Classification of Multi-class Motor Imagery EEG Using Four Band Common Spatial Pattern

Amama Mahmood, Rida Zainab, Rushda Basir Ahmad, Maryam Saeed, and Awais Mehmood Kamboh  
*39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)* (2017)  
Pages 1034–1037 <https://doi.org/10.1109/EMBC.2017.8037003>

## Refereed Symposium, Workshop Papers and Conference Abstracts

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### S.1 From Our Lab to Their Homes: Learnings from Longitudinal Field Research with Older Adults

Amama Mahmood and Chien-Ming Huang  
*AAAI Fall Symposium on Aging in Place* (2024) [symposium, [arXiv](#)]

### A.1 Care To Explain? Differential Impacts of Explanation Types On Physician Trust In AI

Drew Prinster\*, Amama Mahmood\*, Suchi Saria, Jean Jeudy, Cheng Ting Lin, Paul Yi, Chien-Ming Huang  
*2023 Conference on Machine Intelligence in Medical Imaging* (Society for Imaging Informatics in Medicine)  
Podium presentation [conference abstract]

### W.1 How Mock Model Training Enhances User Perceptions of AI Systems

Amama Mahmood, Gopika Ajaykumar, Chien-Ming Huang  
*Human Centered AI (HCAI) workshop at NeurIPS* (2021) [workshop, [arXiv](#)]

## Theses

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### T.3 Designing Conversation Experience: From Traditional to LLM-Powered Voice Assistants

Amama Mahmood  
Department of Computer Sciences, Johns Hopkins University (2025)  
Doctor of Philosophy (Ph.D.) [Thesis](#)

### T.2 Robot Assisted 3D Block Building to Augment Spatial Visualization Skills in Children - An Exploratory Study

Amama Mahmood  
Laboratory for Computational Sensing and Robotics, Johns Hopkins University (2020)  
Master of Science in Engineering (M.S.E.) Robotics [Thesis](#)

# Invited Talks

## Designing Conversational Agents to Empower People and Promote Well-Being

Department of Computer Science, George Mason University  
Human-Computer Interaction (HCI) Brown Bag & CS Seminar, Johns Hopkins University  
Human-Centered AI Class, Northeastern University

May 2025  
April 2025  
February 2025

## Human-AI Interaction for Healthcare: Through the Lens of Radiology

Session: *Bridging the Gap: Mitigating Bias, Building Trust, and Mastering Human-AI Collaboration* at the Annual meeting of *Society for Imaging Informatics in Medicine (SIIM)* May 2025

# Teaching and Mentorship

## Course Instructor, EN.601.491/691 Human-Robot Interaction

Spring 2025

Department of Computer Science, Johns Hopkins University  
Overall quality: 4.11/5.00 (responses = 29, size = 30)  
Teaching effectiveness: 4.21/5.00 (responses = 29, size = 30)

## Teaching Assistant, EN.601.490/690 Introduction to Human-Computer Interaction

Fall 2021

Department of Computer Science, Johns Hopkins University

## Course Assistant, EN.601.491/691 Human-Robot Interaction

Spring 2020

Department of Computer Science, Johns Hopkins University

## Human-Computer Interaction Reading Group Organizer

2020—2023

Intuitive Computing Lab, Johns Hopkins University

## Student Mentor, Johns Hopkins University

2020—present

Mentored undergraduates and graduate students: Co-authored papers: M.1, M.2, M.4, J.5, J.7, C.3, C.7

# Service

## Peer Reviewer

2020—Present

- Peer reviewed (3 special mentions) for ACM Conference on Human Factors in Computing Systems – CHI’24, CHI’25
- Peer reviewed paper for ACM Transactions on Human-Robot Interaction – THRI 2021
- Peer reviewed for ACM/IEEE International Conference on Human-Robot Interaction – HRI’21
- Peer reviewed paper for ACM International Conference on Multimodal Interaction - ICMI 2020

## Organizer Community Outreach

2024, 2025

- Organized a community outreach exhibition at a local senior living center
- Organized workshops for children with special needs

## Organizer Lab Hackathon

Summer 2023

- Organized hackathon for research group on integrating LLMs into voice assistants and robots

## Member of Robotics Graduate Student Association, Johns Hopkins University

2020—2024

# References

Dr. Chien-Ming Huang Ph.D. Advisor	Assistant Professor CS, Johns Hopkins University	<a href="mailto:chienming.huang@jhu.edu">chienming.huang@jhu.edu</a>
Dr. Dakuo Wang	Associate Professor CS, Northeastern University	<a href="mailto:d.wang@northeastern.edu">d.wang@northeastern.edu</a>
Dr. Paul Yi	Associate Member Radiology, St. Jude Faculty	<a href="mailto:paul.yi@stjude.org">paul.yi@stjude.org</a>