

Amama Mahmood

Department of Computer Science

Johns Hopkins University

3400 North Charles Street,

Baltimore, MD 21218, USA

amama.mahmood@jhu.edu

<https://amamamahmood.github.io/>

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

Doctor of Philosophy in Computer Science, Johns Hopkins University **2020—2025**

- Advised by Dr. **Chien-Ming Huang**.

Master of Science in Engineering (Computer Science), Johns Hopkins University **2020—2022**

Master of Science in Engineering (Robotics), Johns Hopkins University **2018—2020**

Bachelor in Electrical Engineering, National University of Sciences & Technology (NUST). **2013—2017**

Research/Work Experience

Graduate Research Assistant, Johns Hopkins University **2019—2020**

Research Assistant, Satellite Servicing Mission NASA Project-Johns Hopkins University **2019—2020**

Research Assistant, Signal, Image and Video Processing lab, LUMS, Pakistan **2017—2018**

Undergraduate Researcher, National University of Sciences and Technology, Pakistan **2016 — 2017**

Honors/Awards

Malone Postdoctoral Fellowship, Johns Hopkins University **2025—2026**

Creel Family Engineering Fellowship, Johns Hopkins University **2020—2021**

Computer Science Department Fellowship, Johns Hopkins University **2020—2021**

Fulbright Scholar **2018—2020**

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)

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 Huang
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, Shamyl 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>

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 33rd 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

- 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

- 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

May 2025

Human-Computer Interaction (HCI) Brown Bag & CS Seminar, Johns Hopkins University

April 2025

Human-Centered AI Class, Northeastern University

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 May 2025 Annual meeting of Society for Imaging Informatics in Medicine (SIIM)

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

chienming.huang@jhu.edu

Dr. Dakuo Wang

Associate Professor
CS, Northeastern University

d.wang@northeastern.edu

Dr. Paul Yi

Associate Member
Radiology, St. Jude Faculty

paul.yi@stjude.org