

Amama Mahmood

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Research Overview

My research, situated at the intersection of HCI, AI and Robotics, focuses on enhancing human-machine interactions to support health and well-being. Specifically, I develop conversational agents-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, "in the wild" human-machine interactions.

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

Education

Doctor of Philosophy in Computer Science , Johns Hopkins University	August 2020 — Present
<ul style="list-style-type: none">Advised by Dr. Chien-Ming Huang	
Master of Science in Engineering (Computer Science) , Johns Hopkins University	May 2022
Master of Science in Engineering (Robotics) , Johns Hopkins University	May 2020
Bachelors in Electrical Engineering , National University of Sciences & Technology (NUST)	June, 2017

Honors/Awards

Creel Family Engineering Fellowship , Johns Hopkins University	August 2020
<ul style="list-style-type: none">Fellowship awarded to one graduate student a year.	
Computer Science Department Fellowship , Johns Hopkins University	August 2020
<ul style="list-style-type: none">Awarded by the CS PhD Admissions Committee for a prospective CS PhD student who has shown exceptional promise.	
Fulbright Scholar	2018-2020
<ul style="list-style-type: none">A prestigious scholarship awarded to select students in the world for their graduate degrees.	

Research/Work Experience

Research Assistant , Johns Hopkins University	August 2019 — Present
<ul style="list-style-type: none">Conducting research in Laboratory for Computation Sensing and Robotics and Intuitive Computing Lab.Currently exploring user interactions with advanced conversational agents powered by LLMs focusing on the longitudinal aspects of user experience in personal spaces to support health and well-being for older adults.	
Research Assistant , Satellite Servicing Mission NASA Project-Johns Hopkins University	March 2019 — Dec 2019
<ul style="list-style-type: none">Employed computer vision techniques on video stream of blade cutting through multilayer insulation hat on the satellite body to get an estimate of forces acting on blade.	
Research Assistant , Signal, Image and Video Processing lab, LUMS, Pakistan	Oct 2017 — July 2018
<ul style="list-style-type: none">Worked on applications of brain computer interfacing. Presented feasibility analysis of existing multiclass motor imagery systems for real-time applications.	
Undergraduate Researcher , National University of Sciences and Technology, Pakistan	Feb 2016 — Sept 2017
<ul style="list-style-type: none">Worked on brain computer interface to drive a telepresence robot with motor imagery EEG commands.Worked on SmartSIM, a virtual reality simulator for training in laparoscopic surgery.	

Publications

(§ selected publications) [Google Scholar](#)

Human-AI Interaction: Conversational Agents

§ **Amama Mahmood**, Shiye Cao, Maia Stiber, Victor Antony, and Chien-Ming Huang - Voice Assistants for Health Self-Management: Designing for and with Older Adults *CHI Conference on Human Factors in Computing Systems* [Accepted, [arXiv](#)] **2025**

§ **Amama Mahmood**, Junxiang Wang, and Chien-Ming Huang - Situated Understanding of Older Adults' Interactions with Voice Assistants [Under review, [arXiv](#)] **2025**

§ **Amama Mahmood**, Junxiang Wang, Bingsheng Yao, Dakuo Wang, and Chien-Ming Huang - User Interaction Patterns and Breakdowns in Conversing with LLM-powered Voice Assistants In *International Journal of Human-Computer Studies* [[arXiv](#)] **2025**

Amama Mahmood and Chien-Ming Huang - From Our Lab to Their Homes: Learnings from Longitudinal Field Research with Older Adults In *AAAI Fall Symposium on Aging in Place* [symposium, [arXiv](#)] **2024**

§ **Amama Mahmood** and Chien-Ming Huang - Gender Biases in Error Mitigation by Voice Assistants In *ACM Conference on Computer-Supported Cooperative Work and Social Computing (CSCW)* **2024**

Sze-yi Chan, Jiachen Li, Bingsheng Yao, **Amama Mahmood**, and Chien-Ming Huang, Holly Jimison, Elizabeth D Mynatt, Dakuo Wang - "How to Let The Lettuce Dry Without A Spinner?": Explore The Advantages And Challenges When Employing An LLM-Based Voice Assistant in Cooking Scenarios [Major revision, [arXiv](#)] **2024**

§ **Amama Mahmood**, Jeanie W Fung, Isabel Won, and Chien-Ming Huang - Owning Mistakes Sincerely: Strategies for Mitigating AI Errors In *CHI Conference on Human Factors in Computing Systems* **2022**

Human-Robot Collaboration

Kaitlynn Taylor Pineda, **Amama Mahmood**, and Chien-Ming Huang - "You Might Like It": How People Respond to Small Talk in Human-Robot Collaboration [Under review, [arXiv](#)] **2024**

Sally Cao, Jiwon Moon, **Amama Mahmood**, Victor Antony, Ziang Xiao, Anqi Liu, and Chien-Ming Huang – "Let Me Finish My Thought": Interruption Handling for Conversational Robots [Under review] **2024**

Human-AI Interaction: Digital Agents

Drew Prinster*, **Amama Mahmood***, Suchi Saria, Jean Jeudy, Cheng Ting Lin, Paul Yi, Chien-Ming Huang - Care to Explain? AI Explanation Types Differentially Impact Physician Diagnostic Performance and Trust in AI In *Radiology* *equal contribution **2024**

Amama Mahmood and Chien-Ming Huang - Effects of Rhetorical Strategies and Skin Tones on Agent Persuasiveness in Assisted Decision-Making In *Proceedings of the ACM International Conference on Intelligent Virtual Agents* **2022**

Amama Mahmood, Gopika Ajaykumar, Chien-Ming Huang - How Mock Model Training Enhances User Perceptions of AI Systems In *Human Centered AI (HCAI) workshop at NeurIPS* [workshop, [arXiv](#)] **2021**

Others

Carlos Aguirre, Shiye Cao, **Amama Mahmood**, and Chien-Ming Huang - Crowdsourcing Thumbnail Captions: Data Collection and Validation. Invited article at *ACM Transactions on Interactive Intelligent Systems (TIIS)* **2023**

Carlos A Aguirre, **Amama Mahmood**, and Chien-Ming Huang - Crowdsourcing Thumbnail Captions Using Time-Constrained Methods In *27th International Conference on Intelligent User Interfaces* **2022**

Amama Mahmood, Balazs P Vagvolgyi, Will Pryor, Louis L Whitcomb, Peter Kazantzides, and Simon Leonard - Visual Monitoring and Servoing of a Cutting Blade during Telerobotic Satellite Servicing In *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* **2020**

Amama Mahmood, Rida Zainab, Rushda Basir Ahmad, Maryam Saeed, and Awais Mehmood Kamboh - Classification of Multi-class Motor Imagery EEG Using Four Band Common Spatial Pattern In *39th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC)* **2017**

Zohaib Amjad Khan, Nabeel Kamal, Asad Hameed, **Amama Mahmood**, Rida Zainab, Bushra Sadia, Shamyil Bin Mansoor, and Osman Hasan - SmartSIM - A Virtual Reality Simulator for Laparoscopy Training Using a Generic Physics Engine In *The International Journal of Medical Robotics and Computer Assisted Surgery* **2017**

Teaching and Mentorship

Course Instructor , <i>Johns Hopkins University</i>	Spring 2025
<ul style="list-style-type: none"> Teach, grade and hold office hours EN.601.491/691 Human-Robot Interaction 	
Teaching Assistant , <i>Johns Hopkins University</i>	Fall 2021
<ul style="list-style-type: none"> Graded and held office hours EN.601.490/690 Introduction to Human-Computer Interaction Guest lecture on Human-AI Interaction 	
Course Assistant , <i>Johns Hopkins University</i>	Spring 2020
<ul style="list-style-type: none"> Graded and held office hours EN.601.491/691 Human-Robot Interaction 	
Reading Group Organizer , <i>Johns Hopkins University</i>	Summer 2020 – Spring 2023
<ul style="list-style-type: none"> Organized weekly reading group for members of research lab on various topics of Human-AI and Human-Robot Interaction 	
Student Mentor , <i>Johns Hopkins University</i>	2020-present
<ul style="list-style-type: none"> Mentored 2 local high school students Mentored 5 undergraduates, 1 graduate and 2 PhD student at Johns Hopkins University Currently mentoring 3 graduate students at Johns Hopkins University for research projects to support health and well-being 	

Service

Peer Reviewer	2020 — Present
<ul style="list-style-type: none"> Peer reviewed (2 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 Lab Hackathon	Summer 2023
<ul style="list-style-type: none"> Organized hackathon for research group on integrating LLMs into voice assistants and robots 	
Organizer Community Outreach Expo	Summer 2024
<ul style="list-style-type: none"> Organized a community outreach exhibition at a local senior living center 	
Member of Robotics Graduate Student Association , <i>Johns Hopkins University</i>	2020 — 2024

Skills

Programming Alexa skills kit, Web API, JavaScript, HTML, CSS, ASP.NET, Python, C#, C, C++, R, MySQL, MATLAB, Mathematica, Verilog HDL, G, Assembly and Embedded C for Microcontrollers

Research Empirical research, Qualitative methods, Quantitative methods, Fundamental lab studies, Longitudinal field studies, Co-design, Human-centered design, Statistical analysis, Hypothesis testing

Software ROS, JMP, SPSS

Simulation Gazebo, Rviz, Cadence, Simulink, Orcad Pspice, AutoCAD, Proteus, Keil, Xilinx, MPLAB, Arduino, ADS, OpenVibe