

Callie Y. Kim

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Research Interests

My research focuses on human-centered approaches to end-user robot programming. I investigate how to design interactive systems that help users specify, verify, and refine robot behavior through three complementary mechanisms: scaffolding that structures intent expression, verification that makes robot interpretation transparent, and proactivity that enables robots to anticipate ambiguity and elicit clarification. My work spans extended reality (XR) interfaces, multi-agent LLM architectures, and empirical studies of how people communicate task intent to robots.

Education

PhD	University of Wisconsin-Madison , Computer Sciences	Madison, WI Sept 2021 – Present
	• Advisor: Dr. Bilge Mutlu	
MS	University of Maryland , Computer Science	College Park, MD Aug 2019 – May 2021
	• Advisor: Dr. Huaishu Peng	
BS	Ewha Womans University , Computer Science and Engineering	Seoul, South Korea Mar 2015 – Feb 2019

Publications

** indicates equal contribution*

SHRIMP: Iterative Refinement of Robot Task Plans	2026
Schroder, M., Hwang, Y., Kim, C. , Cheng, L., Liu, J. L.-C., Zheng, C., He, X., Mutlu, B. The 39th Annual ACM Symposium on User Interface Software and Technology (UIST '26)	
Generative Scaffolding in End-User Design and Programming of Social Robots	2026
Sato, A.*, Kim, C.* , White, N., Maneesh, A., Wang, Y., Ho, H., Mutlu, B. Designing Interactive Systems Conference (DIS 26)	
Supporting Money Management among Adults with Down Syndrome: A Multi-Technology Probe Study	2026
Johnson, H. L., Spalitta, H., Kim, C. , Mutlu, B. ACM Human Factors in Computing Systems (CHI 26)	
RoboCritics: Enabling Reliable End-to-End LLM Robot Programming through Expert-Informed Critics	2026
Kim, C. , White, N., He, E., Sala, F., Mutlu, B. ACM/IEEE Human-Robot Interaction (HRI 26). Honorable Mention Award . 23.2% acceptance rate	
Elements of Robot Morphology: Supporting Designers in Robot Form Exploration	2026
Koike, A., Guo, S. G., He, X., Kim, C. , Sullivan, D., Mutlu, B. ACM/IEEE Human-Robot Interaction (HRI 26). 23.2% acceptance rate	
Bridging Generations using AI-Supported Co-Creative Activities	2025
Kim, C. , Sato, A., White, N., Ho, H., Lee, C., Hwang, Y., Mutlu, B. ACM Human Factors in Computing Systems (CHI 25). Honorable Mention Award . 24.9% acceptance rate	
Understanding Large-Language Model (LLM)-powered Human-Robot Interaction	2024

Kim, C.*, Lee, C.* , Mutlu, B.

ACM/IEEE Human-Robot Interaction (HRI 24). 24.7% acceptance rate

Patent

Virtual Reality Based Disaster Education Method, Device and Computer Readable Medium for Performing the Method

Sangsoo Park, **Callie Y. Kim**, Ina Shin, Hyunkyung Jung

Korean Patent No. 10-2113926, granted May 15, 2020. Application No. 10-2018-0160585. DOI: [10.8080/1020180160585](https://doi.org/10.8080/1020180160585)



Research Experience

People and Robots Laboratory, University of Wisconsin-Madison, Graduate Research Assistant

Madison, WI
Aug 2021 – Present

- Advisor: Dr. Bilge Mutlu
- **Project Manager**, NSF Engineering Research Center for Human Augmentation via Dexterity (HAND ERC), Sept 2025 – Present
 - Lead research meetings for the University of Wisconsin-Madison team within a seven-institution NSF ERC led by Northwestern University
 - Manage and author NSF reporting deliverables for the center’s annual review cycle
 - Represent the University of Wisconsin-Madison team at NSF center meetings
- Conducted research on end-user robot programming and task specification, designing systems that enable non-expert users to effectively specify, verify, and refine robot behaviors
- Developed a robotics framework combining LLM-based task specification with expert-informed motion-level critics to improve the reliability of robot behaviors
- Building **MISE**, a mixed-initiative robot task planning system pairing a multi-agent LLM backend with an extended reality (XR) frontend, letting users express task preferences through spatial demonstration while the system proactively surfaces ambiguity as feedback anchored to the relevant objects and locations
- Evaluated a block-based robot programming system in community workshops, studying paired end-user workflows

Dept. of Computer Science, University of Maryland, Research Assistant

College Park, MD
July 2020 – May 2021

- Advisor: Dr. Huaishu Peng
- Designed and fabricated wearable VR haptic prototypes using CAD-designed silicone components integrated into custom masks to support accessible spatial understanding

Teaching Experience

- **Lecturer**, University of Wisconsin-Madison, CS502: Theory & Practice of CS Education (Sept 2025)
- **Teaching Assistant**, University of Wisconsin-Madison, CS400: Programming III (Jan 2022 – May 2025); CS537: Intro to Operating Systems (Aug 2021 – Dec 2021)
- **Teaching Assistant**, University of Maryland, CMSC425: Game Programming (Aug 2020 – May 2021)

Mentoring

Mentored undergraduate research assistants at the People and Robots Laboratory, University of Wisconsin-Madison: Camilla Liu (incoming master’s student, Fall 2026), Jeffrey Liu, Anurag Janaswamy, Evan He, Manas Joshi, Chenchen Zheng, Kindred Yi (incoming research associate, MIT, Fall 2026)

Talks and Presentations

From Prompts to Programs: Foundation Models and Interface Design in End-User Robot Programming (invited guest lecture)

Sept 22, 2026

CSCI 680: Human-Robot Interaction, William & Mary (Fall 2026). Host: Yaxin Hu

Multimodal Interface (poster)

2025 – 2026

HAND ERC Research Summit (June 2026); HAND ERC Innovation Day (Nov 2025)

Large-Language Models (LLM) for Human-Robot Interaction (invited talk)

Oct 2024

Mentorship Program on HRI and Robot Learning, University of Virginia

Service

Conference Review: CHI, UIST, DIS, HRI, ICRA, IEEE VR, CSCW

Journal Review: IEEE Transactions on Human-Machine Systems

Grandparents University, Instructor, University of Wisconsin-Madison (annually: July 2022, 2023, 2024)

Skills

Research Methods: System Prototyping, Participatory Design, Semi-Structured Interviews, Community Workshops, Thematic Analysis, Surveys, Mixed-Methods Evaluation

Programming Languages: Python, Java, C#, JavaScript, Swift

Tools and Frameworks: React, ROS, Gazebo, RViz, Unity, Flask, Docker, PyTorch, LangChain, LangGraph, HTML/CSS

AI Techniques and Computational Methods: Large Language Models, Computer Vision (Object Detection), XR