

Yunkyung Kim, PhD

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PROFESSIONAL SUMMARY

HRI Specialist / UX Designer with 13+ years of post-PhD at Amazon Robotics, iRobot, and NASA. Expert in architecting Intent-Communication Models and High-Fidelity Evaluation Frameworks that bridge the gap between frontier AI capabilities and human operational performance. Specialized in deconstructing high-level robotics performance KPIs into granular, quantifiable behavioral metrics, ensuring that system evaluations are rooted in empirical evidence and systematic interaction data rather than subjective heuristics..

TECHNICAL EXPERTISE

- **AI/ML Interaction:** Human-Robot/Autonomous System Interaction Design, Human-in-the-Loop Testing.
- **Systems Engineering:** Multimodal Interaction Standards (Light, Sound, UI), Scalable Design Systems, Human-System Instrumentation, Product Requirement Authoring.
- **Strategy:** UX-Business Value Chain, System Architecture Blueprints, Stakeholder Alignment for R&D.

PROFESSIONAL EXPERIENCE

Amazon Robotics
Senior UX Designer

8/2022 – Present
North Reading, MA

- **Quantitative Interaction Modeling & ROI:** Developed and validated a high-fidelity framework to quantify the "Business Value of HRI" by correlating behavioral interaction metrics with algorithmic efficiency. Established the first direct statistical link between human intervention quality and fleet-wide OpEx reduction, enabling data-driven prioritization of R&D investments.
- **Autonomous Exception Management Policy:** Architected a "North Star" research strategy for robotic failure recovery. Transitioned global operations from reactive troubleshooting to a proactive, state-aware framework, utilizing probability density functions to reduce robotic downtime and cognitive load for users.
- **Scalable HMI Standard Foundations:** Engineered a standardized Human-Machine Interface (HMI) platform designed as a telemetry engine for large-scale data ingestion. This architecture enables the consistent collection of high-dimensional Human-in-the-loop (HITL) data, serving as the foundational training set for reinforcement learning models and behavioral prediction.

iRobot
Principal UX Designer

9/2020 – 7/2022
Bedford, MA

- **Cross-Functional Requirements:** Translated qualitative human behavior insights into technical specifications for the motion-planning and SLAM teams to reduce "collision anxiety" in residential settings.
- **Behavioral Specification:** Defined the interaction logic and navigational "personality" for autonomous mobile agents, ensuring robot trajectories were legible and predictable to users in unstructured home environments.
- **Mental Model Alignment:** Designed the end-to-end synchronization between robotic hardware states (LEDs, motion, sound) and digital applications to manage user expectations of autonomous capabilities.

NASA Johnson Space Center | KBR Inc.
Senior Human Factors Engineer

7/2019 – 9/2020
Houston, TX

- **Mission-Critical HRI:** Authored the Concept of Operations (ConOps) and technical requirements for AR-based visual informatics; served as Robotics SME for habitat-vehicle integration and autonomous docking.
- **XR & Habitability Metrics:** Established quantitative evaluation frameworks and human factors metrics for extended reality (XR) systems, defining the standards for human-system performance in extreme environments.

NASA Ames Research Center | SGT Inc.
Computer Scientist

4/2016 – 7/2019
Moffett Field, CA

- **Free-Flying Robotics:** Led the HRI design for the Astrobeer project, developing the interaction systems for intra-vehicular autonomous robots; focused on robotic state-awareness and "intent" communication.
- **Exploration Ground Data System :** Engineered the user interface architecture for planetary rover telemetry.
- **Telepresence & Robotic Task Allocation :** Conducted human-factors research for the Human-Exploration Telepresence project, optimizing task allocation and control-loop latencies for earth-to-orbit robotic manipulation.

Samsung Electronics
Senior UX Designer

3/2013 – 3/2016
Seoul, South Korea

- **Emerging Form Factors:** Spearheaded R&D for "Next Mobile UX," defining the interaction logic for foldable and transparent displays through iterative hardware-software co-design.
- **IP & Patent Strategy:** Directed UX Patent Strategy development for mobile and home appliance verticals, securing intellectual property for novel "Small Screen" and "Flexible/Transparent" interaction models.

SELECTED PUBLICATIONS

- **Kim, Y.** and Mutlu, B. "How social distance shapes human-robot interaction." *International Journal of Human-Computer Studies*, 72(12), 783-795, 2014.
- Cha, E., Fitter, N. T., **Kim, Y.**, Fong, T., and Matarić, M. J. "Effects of robot sound on auditory localization in human-robot collaboration." *Proc. of the ACM/IEEE International Conference on Human-Robot Interaction*, 434-442, 2018.
- Ma, L. M., Fong, T., Micire, M. J., **Kim, Y. K.**, and Feigh, K. "Human-robot teaming: Concepts and components for design." *Field and Service Robotics: Results of the 11th International Conference*, 649-663, 2017.
- **Kim, Y.** and Fong, T. "Signaling robot state with light attributes." *Companion Proc. of the ACM/IEEE International Conference on Human-Robot Interaction*, 163-164, 2017.

PROFESSIONAL SERVICE

- **Founder / President:** Korean New England Robotics and AI, 2025–Present.
 - Leading a Korea community of Robotics and AI professionals to orchestrate seminars and networking initiatives with 100+ members.
- **Associate Reviewer:** ACM/IEEE International Conference on Human-Robot Interaction (HRI), 2021–Present.
- **Associate Reviewer:** IEEE International Conference on Robot and Human Interactive Communication (RO-MAN), 2017–Present.

EDUCATION

Ph.D. in Industrial Design Korea Advanced Institute of Science and Technology (KAIST), 2013

- Dissertation Title: Human-Robot Social Distance in Interaction Design for Robot Acceptance

B.S. in Business Administration Korea National Open University, 2013

B.S. in Industrial Design KAIST, 2008