

## Emily Fang

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### Education

North Carolina State University, Raleigh, NC

**Ph.D in Industrial Engineering** (GPA: 4.00)

Aug 2024 - Present

Human Factors Engineering, Human-Computer Interaction

**B.S in Industrial Engineering** (GPA: 3.77)

Aug 2019 - May 2024

Minor in Supply Chain Management

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### Experience

**North Carolina State University - Graduate Research Assistant**

May 2024 - Present

*AI-Assisted Augmented Reality Checklists for Occupational Hazard Recognition and Mitigation*

Aug 2025 - Present

- Developed and built an augmented reality prototype in Unity (C#), deploying to Meta Quest 3 using the passthrough camera API to overlay hazard-mitigation checklists in the user's real environment.
- Integrated OpenAI GPT-4o via API with a gesture-driven Unity UI, sending Meta Quest 3 passthrough camera snapshots to generate context-specific hazard-mitigation checklists and parsing structured JSON into interactive canvas elements.

*Short-Term Cognitive Effects of Different Video Game Tasks*

May 2024 - Present

- Administered 2-hour in-lab experimental protocols with adult participants, conducting standardized cognitive assessments to measure selective attention, inhibitory control, working memory, and multitasking abilities pre- and post-intervention.
- Facilitated computer-based tasks, conducted semi-structured interviews, and collected behavioral performance, eye-tracking, and survey data (Qualtrics, PANAS, NASA-TLX) for quantitative and qualitative analysis.

*Scale Cognition Advanced Learning Environments in Virtual Reality (SCALE-VR)*

Aug 2023 - Jul 2025

- Collaborated with interdisciplinary teams across education, design, and engineering to assist in the iterative development of a NSF-funded VR application (Award #2055680) designed to teach students concepts of scale and numeracy.
- Conducted qualitative analysis on formative evaluation data through qualitative coding and Thematic Analysis, identifying insights to enhance usability and user experience.
- Assisted in outreach initiatives at the NC Science Museum and a local underserved middle school, engaging students in educational activities and promoting interest in science and technology.

**North Carolina State University - Undergraduate Research Assistant**

Aug 2021 - May 2024

*Augmented Reality for Engineering Education Enhancement (AREEA)*

Oct 2022 - May 2024

- Collaborated with a Ph.D. researcher to conduct a mixed-methods evaluation of a game-based augmented reality application aimed at teaching statistics, engaging directly with participants to collect both qualitative and quantitative data.
- Facilitated data collection by administering validated questionnaires, conducting interviews, and guiding participants through evaluation tasks. Conducted qualitative and quantitative analysis to generate insights on usability and UX.

*Virtual Instructor Application 2 (VIA 2)*

Aug 2021 - Oct 2022

- Assisted a Ph.D. researcher to iteratively improve an augmented reality-based postural training tool for occupational safety, applying both qualitative and quantitative research methods to evaluate and refine usability and effectiveness.
- Utilized various research methodologies, including PSSUQ (Post-Study System Usability Questionnaire), Bipolar Laddering, and Semi-Structured Interviews to deliver actionable insights on tool usability and training outcomes.

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### Publications

- Perera, G. N., **Fang, E.**, Bottomley, L., Chen, K. B., & Ivy, J. (2025). Study Design and Assessment Framework for Testing Augmented Reality Tools in Engineering Education. *2025 ASEE Annual Conference & Exposition*. <https://peer.asee.org/57157>
- **Fang, E.**, Kulasingam, R., Cheng, F., Peterson, M., Delgado, C., & Chen, K. B. (2025). Examining User Interactions With Signaling Elements in a Virtual Reality Learning Application. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 0(0). <https://doi.org/10.1177/10711813251360711>
- Cheng, F., **Fang, E.**, & Chen, K. B. (2025). Mental Models of Gestural Interaction for Information Processing in Virtual Reality. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 0(0). <https://doi.org/10.1177/10711813251357931>
- **Fang, E.**, Sivaramakrishnan, A., & Chen, K. B. (2024). Negative Emotions From Virtual Reality Usage: A Preliminary Exploratory Study Using Online Forums. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 0(0). <https://doi.org/10.1177/10711813241275079>

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### Achievements

- National Institute of Occupational Safety and Health Graduate Fellowship at NC State University, 2025 - Present
- Provost's Doctoral Fellowship at NC State University, 2024 - 2025
- Graduate Merit Award at NC State University, 2024 - 2025
- Institute of Industrial and Systems Engineers Applied Ergonomics Conference *Student of the Year Award*, 2023

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### Skills

- JavaScript, Python, C#, Typescript, Node.js, React, R Studio, Tableau, Qualtrics, Dedoose, NVivo, Unity3D
- Continuous Improvement, Experimental Design, Mixed Methods, Qualitative and Quantitative Analysis, Root Cause Analysis, Study Coordination, Technical Writing, Thematic Analysis, Usability Analysis, User-Centered Design
- English: Native or Bilingual proficiency; Mandarin: Native or Bilingual proficiency