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

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.

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* **[1st place winner for Best New Career Paper Award]**
- **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*

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*

Skills

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