SooYeon Kim

Madison, Wisconsin, USA

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Research Statement

I am a Human Factors and Mixed-Methods UX researcher with experience leading large-scale VR studies (N=40) and Unity traffic simulations (N=200+) to investigate how system design influences user well-being, cognition, and behavior. I have built statistical and machine learning models that fuse behavioral, physiological, and text data, generating actionable insights for user-centered mobility systems.

Education

University of Wisconsin-Madison — *Wisconsin, US*
Ph.D. in Industrial and Systems Engineering (Expected Graduation: June, 2026) — *September 2022 - Current*

- Cognitive Systems Lab (Advisor: Professor John D Lee)
- Ph.D. Minor in Computational Human Behavior

Seoul National University — *Seoul, KR*
M.S. in Industrial and Systems Engineering — *January 2020 - May 2022*

Yonsei University — *Seoul, South Korea*
B.S. in Creative Technology and Management — *March 2015 - August 2019*

Research Experience

University of Wisconsin–Madison — *Wisconsin, US*
Graduate Research Assistant — *September 2022 – Current*

- Led **end-to-end Unity traffic simulations** (N=201) and **VR driving study** (N=40) with journaling interventions; integrated behavioral, physiological, and text analytics to assess road user well-being and prosociality (Paper 14)
- Defined and modeled **prosocial driving behaviors** through simulated scenarios and multi-level contextual analysis (Paper 1)
- Designed and deployed **dynamic traffic scenarios in Unity** for controlled online simulation experiments (Paper 11–14)
- Built **statistical models** to understand interdependence between road user well-being, cognition, and behavior (12–13)
- Applied **choice-based conjoint modeling** to evaluate persuasive social norm–based nudges in automated driving (Paper 4)

North Carolina State University — *North Carolina, US*
Visiting Scholar — *October 2021 – April 2022*

- Assessed **usability of AI-based biomarker systems** for brain modulation using user-centered design frameworks
- Performed advanced **neuroimaging data analyses** to extract significant biomarkers and cognitive patterns

Seoul National University — *Seoul, KR*
Graduate Research Assistant — *January 2020 – June 2022*

- Developed a **ResNet18-based classification framework**, achieving 80% accuracy in detecting driver attention states (Paper 6)
- Analyzed **driver sentiment** on EV auditory experiences using think-aloud data (N=30) with ABSA of 210K+ online reviews (Papers 5 - 6)
- Established **ergonomic design standards** for accessible appliances, with specialized focus on elderly and disabled users (Paper 7)
- Validated **EEG and HRV metrics** as physiological indicators for evaluating conversational interfaces (Paper 9)

Yonsei University — *Seoul, KR*
Undergraduate Research Assistant — *September 2018 – December 2019*

- Evaluated **companion robot prototypes** for elderly users through a large-scale living-lab study (N=244) and comprehensive user experiments, analyzing tactile and visual interaction preferences to inform design guidelines (Paper 10)

Skills

Experiment Design Human-subject & longitudinal studies; VR/simulator scenarios; cognitive tasks (Unity, PsychoPy)

Data Analysis Statistical & ML modeling (incl. LLMs); multivariate methods (factor analysis, PCA, EFA); text/sentiment analysis

Technical Proficiencies Python, R, MATLAB, Tableau; Driving Simulator, Eye-tracking, EEG, ECG, VR; survey/interview platforms (Qualtrics, Prolific, MTurk)

Publications

Published or Accepted Papers

1 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Kevin Salubre, and John D. Lee. "Defining Prosocial Behavior in Traffic: Linking Behavior to Perception." In *In Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, vol. 69. Sage CA: Los Angeles, CA: SAGE Publications, 2025.

2 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Teruhisa Misu, and John D. Lee. "Prosociality Matters: How Does Prosocial Behavior in Interdependent Situations Influence the Well-being and Cognition of Road Users?." In *Proceedings of the 16th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*, pp. 395-404. 2024.

3 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Teruhisa Misu, and John D. Lee. "Does Prosocial Automation Increase Driver's Well-being?." In *In Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, vol. 68, no. 1, pp. 1420-1424. Sage CA: Los Angeles, CA: SAGE Publications, 2024.

4 Lee, Joonbum, Boyoung Kim, Hansol Rheem, Amudha V. Kamaraj, **SooYeon Kim**, Joshua E. Domeyer, John D. Lee, and Heishiro Toyoda. "Towards directive driving automation: Nudging driver's away from overriding using social norms." In *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, vol. 67, no. 1, pp. 1184-1190. Sage CA: Los Angeles, CA: SAGE Publications, 2023.

5 Wang, Cai, **SooYeon Kim**, Yein Song, Sungho Kim, Minsik Choi, Donghoon Seu, and Myung Hwan Yun. "Text Mining for Exploring UX Issues of Qualitative Think Aloud Data on EV Sound." In *2022 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*, pp. 0200-0203. IEEE, 2022.

6 Song, Yein, Myung Hwan Yun, **SooYeon Kim**, Chang S. Nam, and Joong Hee Lee. "A Study on the Driver-Vehicle Interaction System in Autonomous Vehicles Considering Driver's Attention Status." In *2022 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, pp. 3360-3366. IEEE, 2022.

7 Wilfred, Adriance, Minjee Kim, Sungho Kim, Chan Hyeok Yun, NamWoo Cho, Jane Lee, **SooYeon Kim**, Joong Hee Lee, Kyung-Jun Lee, and Myung Hwan Yun. "User Experience Factor Investigation of a Voice User Interface (VUI) for the Elderly." *Proceedings of the HCI KOREA* (2021): 619-624.

8 **SooYeon Kim**, Seijun Chung, Adriance Wilfred, Joong Hee Lee, and Myung Hwan Yun. "User sentiment analysis by Electric Vehicle based on Aspect-Based Sentiment Analysis." In *Proceedings of the Ergonomics Society of Korea* (2020): 29-29.

9 Lee, Seungyeon, Chan Hyeok Yun, Gee Won Shin, **SooYeon Kim**, and Myung Hwan Yun. "Evaluating User Experience Using Physiological Data from Conversational Interfaces for Interactive TV." In *Proceedings of the Ergonomics Society of Korea* (2020): 81-84.

10 **SooYeon Kim**, Young Hoon Oh, and Da Young Ju. "A Study on the Design of Companion Robots Preferred by the Elderly." In *Advances in Human Factors in Robots and Unmanned Systems: Proceedings of the AHFE 2019 International Conference on Human Factors in Robots and Unmanned Systems*, July 24-28, 2019, Washington DC, USA 10, pp. 104-115. Springer International Publishing, 2020.

Papers Under Review

11 **SooYeon Kim** and John D. Lee, "Well-being in Hybrid Societies: A Systematic Review of Well-being in Automation, Transportation, and Road Users", Under Review, *Human Factors Journal*, 2025

Papers Under Preparation

12 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Teruhisa Misu, and John D Lee, "Factors affecting drivers' well-being, cognitive attention, and behaviors under interdependent road situations", 2025

13 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Teruhisa Misu, and John D Lee, "Modeling interdependence in micromobility-pedestrian encounters and its implications for vehicle automation", 2025

14 **SooYeon Kim**, Jahinaya Parker, Shashank Mehrotra, Kumar Akash, and John D. Lee, "Framing Prosocial Reflection: Gratitude Journaling, Retrospective Reframing, and Well-Being", 2025

Achievements

2022 **HFES Student Chapter Award**, Human Factors and Ergonomics Society
2022 **Chancellor's Opportunity Award**, University of Wisconsin-Madison
2021 **High-Potential Individuals Global Training Program Fellowship**, Korea Institute for Information & Communication Technology Planning
2020 **Brain Korea 21 Plus Program Scholarship**, National Research Foundation of Korea

Presentations

Invited Talks

1 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Teruhisa Misu, and John D. Lee, "Prosociality Matters: How Does Prosocial Behavior in Interdependent Situations Influence the Well-being and Cognition of Road Users?," *16th International Conference on Automotive User Interfaces and Interactive Vehicular Applications*, Palo Alto, CA, 2024

2 **SooYeon Kim**, Shashank Mehrotra, Kumar Akash, Teruhisa Misu, and John D. Lee, "Does Prosocial Automation Increase Driver's Well-being?," *Human Factors and Ergonomics Society Annual Meeting*, Phoenix, AZ, 2024

3 **SooYeon Kim**, Seijun Chung, Adriance Wilfred, Joong Hee Lee, and Myung Hwan Yun, "User sentiment analysis by Electric Vehicle based on Aspect-Based Sentiment Analysis," *Proceedings of the Ergonomics Society of Korea*, Seoul, Korea, 2020

4 **SooYeon Kim**, Young Hoon Oh, and Da Young Ju, "A Study on the Design of Companion Robots Preferred by the Elderly," *AHFE International Conference on Human Factors in Robots and Unmanned Systems*, Washington DC, 2019

Teaching Experience

406.304_001: Human Factors Engineering — *Seoul National University, KR*
Teaching Assistant — *Fall 2020*
- Class size: 80 undergraduate and graduate students
- Led 3 weekly lab sessions (50 mins each), weekly office hours, assisted in homework and exam design, graded student assignments and projects

406.427A_001: Human Interface Design — *Seoul National University, KR*
Teaching Assistant — *Spring 2020*
- Class size: 60 undergraduate and graduate students
- Taught 3 weekly lab sessions (40 mins each), weekly office hours, assisted in homework and exam design, graded student assignments and projects

406.305A_001: Human Factors Engineering Experiment and Practice — *Seoul National University, KR*
Teaching Assistant — *Fall 2020, Fall 2021*
- Class size: 80 undergraduate and graduate students
- Guided students through experimental protocols and data collection
- Supervised laboratory equipment (Driving simulator, sensors, and physiology device) and experimental setup

CTM3015-01-00: Technovation — *Yonsei University, KR*
Teaching Assistant — *Spring 2018*
- Class size: 20 undergraduate students
- Facilitated innovation workshops and team projects
- Assisted with course logistics and student evaluations

CTM3017-01-00: IT Business Model Analysis & Development IoT Foundation — *Yonsei University, KR*
Teaching Assistant — *Spring 2018*
- Class size: 25 undergraduate students
- Supported business model development projects and designed class materials
- Assisted with course logistics and student evaluations

Leadership & Reviewer Experience

The Human Factors and Ergonomics Society Conference
Reviewer — *2025*

Human Factors and Ergonomics Society — *Wisconsin, US*
Finance Chair, UW-Madison Student Chapter — *Fall 2022 - Summer 2023*

Yonsei Habitat for Humanity — *Seoul, KR*
Vice President, Habitat for Humanity — *Fall 2015 - Summer 2017*