Yein Song

Postdoctoral Researcher, Human Interface Systems Laboratory
Department of Industrial Engineering, Seoul National University, Seoul, South Korea

songbycamel@snu.ac.kr   https://songbycamel.com   https://www.linkedin.com/...   https://scholar.google.com/...

RESEARCH INTERESTS

- Digital human modeling for physical and cognitive discomfort monitoring and prediction
- Multimodal feature engineering on physiological signals and computer vision data, integrated with subjective measures
- Evaluation frameworks and experimental design
- Autonomous and electric vehicles, and home appliance ecosystems

EDUCATION

Seoul National University, Seoul, South Korea   Sep 2021 - Present
Ph.D., Department of Industrial Engineering (Advisor: Dr. Myung Hwan Yun)

Seoul National University, Seoul, South Korea   Sep 2019 - Aug 2021
M.S., Department of Industrial Engineering (Advisor: Dr. Myung Hwan Yun)

Chungnam National University, Daejeon, South Korea   Mar 2013 - Aug 2019
B.S., Department of Architecture

PUBLICATIONS & PRESENTATIONS

Thesis

[Ph.D.] Design of Non-Invasive Real-Time Monitoring and Mitigation Interfaces for Passenger's Driving Discomfort in Autonomous Vehicles

[M.S.] A Qualitative Study on the Auditory Experience of Driving Sound in Electric Vehicles Considering User Characteristics and Context of Driving

Journals

[3] **Song, Y.**, Kim, D., Lee, J. & Yun, M. H. (2025) Exploring Auditory Experiences in Electric Vehicles: A User Impression Study on the Impact of Sound and User Characteristics in Different Driving Contexts. *Human Factors*

[2] **Song, Y.**, Bae, J., Shin, J., Yang, J., Kim, S., Bahn, S., & Yun, M. H. (2025). Real-Time Motion Sickness Measurement: Feasibility and Application of the Real-Time Motion Sickness Scale (RMS). *Applied Ergonomics*

[1] **Song, Y.**, Kim, W., & Yun, M. H. (2024). Auditory experience in vehicles: A systematic review and future research directions. *Heliyon*

Work in Progress

[3] Song, Y., Bahn, S., & Yun, M. H., Real-time Motion Sickness Prediction: A Multimodal Framework with Physiological and Facial Monitoring

[2] Shin, G., **Song, Y.**, Ahn, S., & Yun, M. H., Toward Contextually Optimal Takeover Support: An Experimental Study of Immersive Auditory Engagement, Takeover Request Design, and Hazard Scenario Type in Automated Driving

[1] **Song, Y.**, Lee, K., Shin, G., & Yun, M. H., User-Centric Design for Intelligent Financial Platforms: Bridging the Gap between User Types and AI-Driven Services (Under review)

International Conferences

[15] Park, S., **Song, Y.**, Cho, S., & Yun, M. H. (2026).When Trust Splits the Room : Comparing User Trust and Experiences with Human and LLM Counselors. In 2026 ACM CHI EA

[14] **Song, Y.**, Lee, K., Shin, G., & Yun, M. H. (2025). Enhancing User Experience in Integrated Financial Services by Deriving User Types and Design Implications. In 2025 HFES Annual Meeting

[13] Kim, H., **Song, Y.**, Yun, M. H., Kim, K. (2024). Development and Validation of an Ergonomic Posture Assessment System Utilizing Workplace Video Analysis. In 2024 IEEE IEEM

[12] Shin, J., **Song, Y.**, ... & Yun, M. H. (2024). Evaluation of Usability and Arousal Levels in Electric Vehicles Using In-Vehicle Physiological Signals: A Focus on Motion Sickness. In IEA 2024

[11] **Song, Y.**, (2024). AI-Based Human Modeling for Optimizing Driving Comfort in Autonomous Vehicles. In IEA 2024

[10] **Song, Y.**,, Shin, J., Park, J., ... & Yun, M. H. (2024). An Evaluation Tool for Real-Time Motion Sickness in a Driving Environment. In 2024 HFES Annual Meeting

[9] **Song, Y.**, Yoon, B., Park, ... & Yun, M. H. (2023). A Systematic Literature Review for Measure, Estimation, and Mitigation of Motion Sickness in Vehicle Environment. In 2023 HFES Annual Meeting

[8] **Song, Y.**, Lee, J., Wang, C., & Yun, M. H. (2023). Enhance auditory experience by identifying user needs and classifying user types while driving electric vehicles. In 2023 HFES Annual Meeting

[7] **Song, Y.**, Choi, M., Ahn, S., & Yun, M. H. (2023). A Framework for the Design and Evaluation of Auditory Experience in Vehicle Environment Based on the Literature Review. In 2023 HFES Annual Meeting

[6] **Song, Y.**, Park, J., Wang, C., & Yun, M. H. (2023). Exploring the Latest Trends in Motion Sickness Research: A Network Analysis Approach, In 2023 ACED

[5] Yoon, B. Y., Ahn, S. H., Oh, J., **Song, Y.**, ... & Yun, M. H. (2023). JS-01 Exploring Korean Female Lower Body Classification based on Factor Analysis and Fuzzy C-means Clustering. In 2023 ESK & JES Joint Symposia

[4] Seu, D., **Song, Y.**, Wang, C., ... & YUN, M. H. (2023). JS-02 Semantic Network Analysis of ChatGPT Research: An Interdisciplinary Perspective. In 2023 ESK & JES Joint Symposium

[3] **Song, Y.**, Yun, M. H., Nam, C. S., ...(2022). A Study on the Driver-Vehicle Interaction System in Autonomous Vehicles Considering Driver's Attention Status. In 2022 IEEE SMC

[2] Wang, C., Kim, S. Y., **Song, Y.**, ... & Yun, M. H. (2022). Text Mining for Exploring UX Issues of Qualitative Think Aloud Data on EV Sound. In 2022 IEEE IEEM

[1] **Song, Y.**, Kim, S., Lazaro, M. J., Ha, S., & Yun, M. H. (2021). A Study on User Characteristics and User Types in Designing Auditory Experience for Electric Vehicles. In 2021 IEEE IEEM

Domestic Conferences

[12] **Song, Y.**, Lee, K., Shin, G., Yun, & M. H. (2024). Enhancing User Experience in Integrated Financial Services: Insights from a Text Analysis on Daily Reconstruction Method. In 2024 ESK

[11] Shin, J., **Song, Y.**, Bae, J., Yang, J., & Yun, M. H. (2024). Development of a Model for Predicting Motion Sickness Using Electrocardiogram (ECG). In 2024 KSNVE

[10] Rhui, E., **Song, Y.**, Bae, J., ... & Yun, M. H. (2024). Usability Evaluation and Design Recommendations for User-Centered Smart TV Remote Control. In 2024 HCI Korea

[9] **Song, Y.**, Oh, M., Yoon, B., ... & Yun, M. H. (2023) Development of Navigational Aids Training Content and Human Resource Development Strategy based on Ergonomics Knowledge, In 2023 ESK

[8] Heo, J., Park, J., **Song, Y.**, ... & Yun, M. H. (2023). Emotion Regulation Infotainment System for Driver Safety. In 2023 KIIE spring

[7] **Song, Y.**, Seu, D., Jung, W., Kim, W., & Yun, M. H. (2022. 10). Identifying User Needs for Electric Vehicle Driving Sound Based on Driving Context Using LDA Topic Modeling. In 2022 ESK

[6] Heo, J., Kim, S., Lee, J., **Song, Y.**, ... & Yun, M. H. (2022). A Study on the Relationship Between Driver's Emotion and Attention Level Based on Deep Learning Analysis of Facial Expressions. In 2022 ESK

[5] Oh, M., **Song, Y.**, Kang, A. A., ... & Yun, M. H. (2022). Auditory user interface for autonomous vehicles: Focusing on non-driving task scenarios. In 2022 ESK

[4] Heo, J., Lazaro, M. J., Lee, J. H., Lee, K. J., **Song, Y.**, ... & Yun, M. H. (2021). Identifying UX Issues for Multimodal Interaction of Intelligent Systems Using User-Centered Design Techniques. In 2021 ESK

[3] **Song, Y.**, Kim, S., Kim, Y. H., Lee, Y., & Yun, M. H. (2020). A Study on the Affective Evaluation of Interior Driving Sound with User Factors and Acoustic Parameters. In 2020 ESK

[2] Kim, H., **Song, Y.**, Lee, K., Kim, S., & Yun, M. H. (2020). Task Analysis and Identification of Accessibility Issues in Appliance Use for People with Disabilities Using Therblig. In 2020 ESK

[1] Kim, S., **Song, Y.**, Lee, K., ...& Yun, M. H. (2020). Designing Consumer Personas and Customer Journey Maps for Financial Services Using Quantitative Everyday Reconstruction Method Data. In 2020 HCI Korea

PROJECTS

- Enhancing Trust and Situation Awareness in Human-AI Teams through Context-Specific Interactions, *National Research Foundation of Korea, Ministry of Science and ICT, 2025.03-Present, Researcher*

- Development of AI-based Human Modeling and Digital Twin Systems for User-Centered Driving Experience Optimization in Fully Autonomous Environments, *National Research Foundation of Korea, Ministry of Science and ICT, 2024.03-Present,* **Principal Investigator**

- Development of Motion Sickness Evaluation Metrics and Models in Real-Driving Environments, *Hyundai Motors, 2023.01-2023.12,* **Project Manager**

- Research on a Framework for Evaluating Personalized Driving Experiences in Autonomous Vehicles Using Explainable AI and Meta-Learning, *National Research Foundation of Korea, Ministry of Science and ICT, 2023.06-2024.02, Researcher*

- Human-in-the-loop AI: Basic research laboratory for smart human-AI collaboration, *National Research Foundation of Korea, Ministry of Science and ICT, 2023.06-2023.10, Researcher*

- Development of AI-Based Decision Support Systems for Patent Monetization, *Ministry of Trade, Industry and Energy, 2023.04-2023.12, Researcher*

- Level 5 Automated Vehicle UX Research and Modeling: Data driven Approach, *LG Electronics, 2023.03-2023.04, Researcher*

- Aids to Navigation (AtoN) Training Program for Senior Vessel Operators, *Ministry of Oceans & Fisheries, 2021.03-2022.10,* **Project Manager**

- Analysis of User Behavior in Display Input Experiences, *Samsung Electronics, 2022.03-2022.04, Researcher*

- Optimal HMI Design for Different Autonomous Driving Levels Based on Driving Situations, *Hyundai Motors, 2022.12-2023.03, Researcher*

- Development of Simulation Software for Airborne Control Equipment (UI/UX Analysis and Design), *Agency for Defense Development, Ministry of Defense, 2022.11-2023.04, Researcher*

- Analysis of Public Transport User Behavior Patterns and Conceptual Research for Preventing the Spread of Infectious Diseases, *Hyundai Motors, 2022.07-2022.08, Researcher*

- Development of an AI-Based Online Collaboration System for Professional Translators, *Ministry of Trade, Industry and Energy, 2021.08-2022.07, Researcher*

- Preliminary Research on Intuitive Auditory UX (Development of Sound Design and Evaluation Methodology), *Hyundai Mobis, 2021.07-2021.11, Researcher*

- Development of AI-based Biomarker Identification and Brain Modulation System, *Institute of Information Communications Technology Planning Evaluation, Ministry of Science and ICT, 2021.05-2021.12, Researcher*

- Development of a Task Analysis Model Using an Artificial Intelligence Modeling of Ergonomic Knowledge (Manual Material Handling/Vehicle Driving/Clinical Care Activities), *National Research Foundation of Korea, Ministry of Science and ICT, 2021.03-2024.02, Researcher*

- Development and Application of Usability Evaluation Metrics for Coway Products, *Coway, 2021.04-2021.10,* **Project Manager**

- Building a Foundation for Enhancing User Experience Labs for Future Mobility, *Ministry of Trade, Industry and Energy, 2020.05-2020.09, Researcher*

- A Framework of Evaluation and Design Thinking for Auditory Experience in Electric Vehicles, *Hyundai Motors, 2020.05-2021.04, Researcher*

- Development of Eco Coaching Technology, *Hyundai Motors, 2020.03-2020.12, Researcher*

- Development of a Smart Chair with Film-Type Pressure Distribution Sensors and Deep Learning for Seated Posture Monitoring, *Ministry of Trade, Industry and Energy, 2019.08-2019.12, Researcher*

- Implementation of Immersive Tourism Technology Using 4D Technology and Emotional Modeling, *Ministry of Culture, Sports and Tourism, 2019.04-2020.02, Researcher*

RESEARCH GRANTS

- **Sejong Science Fellowship, National Research Foundation of Korea** 2026 - 2031

  $ 350K, Grant No. RS-2026-25499164, 0.2em
  Development of a Multimodal AI Agent for Physical Collaboration between Humans and Intelligent Vehicles Based on Human State and Driving Context

- **Ph.D. Candidate Research Fellowship, National Research Foundation of Korea** 2024 - 2026

  $ 17K, Grant No. RS-2024-00409458, 0.2em
  Development of AI-Based Human Modeling and Digital Twin System for Optimizing Use-Centered Driving Quality in Fully Autonomous Driving Environments

ACADEMIC EXPERIENCE

- **Postdoctoral Associate**, Seoul National University Sep 2025 - Present
- **Lecturer**
  - User-Centered Design, Seoul National University Fall 2025
  - Human Factors, Korea National University of Transportation Spring 2026
- **Teaching Assistant**
  - Human Factors 2019
  - Human Factors Experiment 2019 - 2022, 2024 - 2025
  - Human Performance 2020
  - Theories and Lab of VR/AR 2022 - 2025

SERVICE

- **Student Assistant & Student Volunteer**, IEA 2024
- **Reviewer**
  - Conferences: Human Factors and Ergonomics Society (HFES) International Annual Meeting (2023 - 2026), Triennial Congress of the International Ergonomics Association (IEA) (2024)
  - International Journal: Journal of the Audio Engineering Society (2024), International Journal of Human-Computer Interaction (2025 - 2026), Biomedical Human Kinetics (2025), Results in Engineering (2025)
- **Mentoring**, Donghoon Seo, Jungyeon Park at Seoul National University 2023

OTHER EXPERIENCES

- **Corporate Seminar**
  - Data-Driven User Experience Design: Theory and Practice of Network Analysis, *LX Hausys* Apr - May 2023
  - Road-map for Future Automotive Human-Machine Interaction Technologies, *Hyundai Motors* Nov 2021
- **Investigation Work**, Investigation of Musculoskeletal Risk Factors, *Kia Corporation* Jun - Aug 2021
- **Invited Talk**, Human, Space, and Interactions, *HAUA Lab., Chungnam Nation University* 2024.02.14

SKILLS

- **Language:** Korean (Native), English (Intermediate)
- **Programming Language:** Python, R
- **UI/UX Design:** Adobe (Photoshop, Illustrator, After Effects, Premiere Pro), Figma
- **Architectural/Industrial Design:** Rhinoceros with Grasshopper, Auto CAD, Sketch Up, Lumion
- **Others:** Unity, 3D printer, CNC machine

ARCHITECTURAL EXPERIENCES

- **Internship**, SAMOO Architects & Engineers — Jan - Feb 2018
- **Freelance Work**, with Three Architectural Firms and One University — 2014 - 2017

(Last updated: 2026.02.28)