MYEONGKYU LEE

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RESEARCH INTERESTS

Human-Machine Interaction, Driver's Emotion, Vehicle/Driver Safety, Driver's Behavior

EDUCATION

KOOKMIN UNIVERSITY SEOUL, KOREA

Master's Candidate: Automotive and IT convergence

Mar. 2021 - Present

- GPA: 4.0/4.0, Advisor: Prof. Ji Hyun Yang
- Thesis: "Development of Driver's Perspective Framework for Verification of Automated Vehicle Algorithm (tentative)"
- SUNGKOK Scholarship (merit based; full tuition for both years).

Bachelor of Automotive Engineering

Mar. 2015- Feb. 2021

- GPA: 3.98/4.0, 4.41/4.5
- Graduation Scholarship (Graduated 1st out of 166 students)
- Academic Excellence Scholarship (for all four years).

PUBLICATIONS AND PROCEEDINGS

- **M.** Lee, J. Choi, S. Kim, and J. Yang, "Analysis of drivers' reactions to simulated jaywalking and application of AI classifiers to predict accidents," under review, *IEEE Transactions on Human-Machine Systems*. SCIE.
- **M. Lee**, S. Lee, S. Hwang, S. Lim, and J. Yang, "Effect of emotion on galvanic skin response and vehicle control data during simulated driving," under review, *Transportation Research Part F: Traffic Psychology and Behaviour*. SSCI.
- J. Park, **M. Lee**, J. Maeng, C. Ahn, and J. Yang, "A Study for STPA-based Identification of Safety Requirements from the Perspective of Drivers in Take-Over Request Situation," abstract accepted, *3rd IEEE International Conference on Human-Machine Systems*, Florida, US, November 17-19, 2022.
- **M. Lee**, S. Lee, S. Hwang, S. Lim, and J. Yang, "A Study to Acquire the Driving Characteristic Data According to Driver Emotions and to Propose Emotion Groups in the Driving Context," abstract accepted, *3rd IEEE International Conference on Human-Machine Systems*, Florida, US, November 17-19, 2022.
- **M. Lee**, S. Kim, D. Jung, H. Lee, H. Park, H. Han, and J. Yang, "Simulator-Based Study of the Response Time and Defensive Behavior of Drivers in Unexpected Dangers at an Intersection," accepted, *Automotive UI'22*, Seoul, Korea, September 17-20, 2022.
- **M. Lee**, S. Kim, J. Kim, and J. Yang, "Simulator Study on the Response Time and Defensive Behavior of Drivers in a Cutin Situation," *International Journal of Automotive Technology*, Vol. 23, No. 3, pp. 813–823, June 2022. SCIE.
- H. Pyeon, H. Kim, Y. Bae, **M. Lee**, H. Zhu, J. Yang, and S. Lim, "Development of method to acquire Hands on/off answer value," *Proceedings of 2022 Spring Conference of KSAE*, Seoul, June 2-3, 2022.
- **M. Lee**, H. Shim, S. Kim, J. Choi, and J. Yang, "Study of driver's response time in cut-in situation with driving simulator," *Proceedings of 2021 Spring Conference of ESK*, Seoul, June 17-18, 2021.

PATENTS

- J. Yang, S. Lim, **M. Lee**, H. Zhu, H. Pyeon, and Y. Bae, "Method for Providing a Plurality of Driving Modes Based on Whether a Driver grips Steering Wheel or Not," Korean Patent (filed), 10-2022-0086240
- J. Yang, S. Lim, **M. Lee**, H. Zhu, H. Pyeon, and Y. Bae, "Method for Controlling Steering Wheel Based on Whether a Driver grips Steering Wheel or Not," Korean Patent (filed), 10-2022-0086241
- J. Yang, **M. Lee**, J. Park, and J. Maeng, "Device and Method for Detecting Driver's Steering Wheel Grip," Korean Patent (filed), 10-2022-0073471

Artificial Intelligence Adaptation on the Steering Wheel System

Seoul, Korea

Graduate Research Assistant, Kookmin University

Sept. 2021 - Aug. 2022

- Built environment for acquiring steering-related vehicle data according to hands on/off state.
- Acquired hands on/off state data with steering-related vehicle data under actual driving conditions on the road.
- Predicted hands on/off state according to steering-related vehicle data using AI.
- Outcome: 2 patents, 1 conference presentation.

Study on the Driver's Mental Model and Behavior in Take-over Situations

Seoul, Korea

Graduate Research Assistant, Kookmin University

May 2021 - May 2022

- Examined drivers' mental model (information process) and behavior in take-over situations.
- Implemented dangerous take-over situation using driving simulator and recruited 40 participants.
- Acquired driving control data/survey data according to four NDRT types.
- Analyzed data in terms of the kinds of action people take and the reason for the action.
- Outcome: Thesis, 1 patent, 1 conference paper.

Study on the Vehicle Control Data/Physiological Data According to Emotions

Seoul, Korea

Graduate Research Assistant, Kookmin University

Mar. 2020 - Nov. 2021

- Examined driving control data and physiological data according to emotions.
- Derived eight emotions that usually occur in the driving context.
- Induced eight emotions for 14 participants and acquired vehicle control data/physiological data while driving.
- Analyzed data according to emotions, classified eight emotions into three groups.
- Outcome: 1 journal paper, 1 conference paper.

Study on Driver Behavior Characteristics in Four Dangerous Situations

Seoul, Korea

Undergraduate Research Assistant, Kookmin University

Mar. 2020 - Nov. 2021

- Examined drivers' behavior characteristics in four dangerous situations.
- Implemented four dangerous situations reported frequently at National Forensic Service and recruited 186 participants.
- Acquired perception/reaction time, driving control data according to demographic characteristics (age/gender).
- Analyzed data using descriptive/inferential statistics and Machine Learning.
- · Suggested data trend according to demographic characteristics and method to improve road safety.
- Outcome: 2 journal papers, 1 conference paper, 1 conference presentation

Undetectable Communications for Drone Applications

Irvine. United States

Undergraduate Research Assistant, University of California, Irvine

Dec. 2019 - Feb. 2020

- Implemented cryptic code for interaction between drone and controller.
- Coded for safer and faster response by combining mechanical engineering knowledge with computer science knowledge.
- PI: Dr. Marco Leverato, Mentor: Anas Alsoliman (Ph.D. candidate).

AWARDS AND HONORS

- Competition for creating Intellectual Property based on a paper, 3rd award, Kookmin University, 2022.
- Poster competition of Brain Korea 21 program, 2nd out of 38 students, Kookmin University, 2022.
- Graduation: graduated 1st out of 166 students, College of Automotive Engineering, Kookmin University, 2021.
- Rubber-powered automotive manufacturing competition, 1st out of 6 teams, Kookmin University, 2015.

ADDITIONAL INFORMATION

- Computer/Programming/Technical Skills: MATLAB/SIMULINK, Python, SPSS, R, HTML, CSS, JavaScript, C, C++, LaTeX, SCANeR Studio, Carmaker, MS Office (all advanced)
- Tools: Driving Simulator, Eye Tracker, Physiological Acquisition (GSR, HR, Brain wave etc.)
- Committee Experience: AUTO UI 2022 local chair (2022, Seoul, Republic of Korea)
- Teaching Assistant: Mentoring/Tutoring mathematics, physics (2018 2021, Kookmin University)
- *Military Service*: Sergeant (2016 2017, Republic of Korea Army)
- *Languages:* Korean (native fluency), English (full professional proficiency)