MYEONGKYU LEE

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RESEARCH INTERESTS

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

EDUCATION

KOOKMIN UNIVERSITY   **SEOUL, KOREA**

Master Candidate of Automotive and IT convergence   *Mar. 2021 – Present*
- GPA: 4.0/4.0, Advisor: Prof. Ji Hyun Yang
- Thesis: "T.B.D."
- SUNGKOK Scholarship (Merit based, Full tuition for all two 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

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, 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 Transaction 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.

M. Lee, S. Kim, D. Jeong, 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", *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 Cut-in 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, 2-3, June, 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, 17-18, June, 2021.

PATENTS (Selected)

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, 10-2022-0086240

J. Yang, **M. Lee**, J. Park and J. Maeng, "Device and Method for Detecting Driver's Steering Wheel Grip", Korean Patent, 10-2022-0073471

RESEARCH EXPERIENCE (Selected)

Artificial Intelligence Adaptation on the Steering Wheel System　　　　　　　　　　**Seoul, Korea**

Main Researcher, Kookmin University　　　　　　　　　　　　　　　　　　　　　　*Sept. 2021 – Present*

- Build environment for acquiring steering-related vehicle data according to hands on/off state.
- Acquire hands on/off state data with steering-related vehicle data on the real road.
- Predict hands on/off state according to steering-related vehicle data using AI.
- Performance: 2 patents, 1 proceeding.

Study on the Driver's Mental Model and Behavior in Take-over Situation　　　　　　**Seoul, Korea**

Main Researcher, Kookmin University　　　　　　　　　　　　　　　　　　　　　　*May 2021 – May 2022*

- Examined drivers' mental model (information process) and behavior in take-over situation.
- 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 what kinds of action people take, the reason for the action.
- Performance: Thesis "T.B.D.", 1 patent, 1 proceeding.

Study on the Vehicle Control Data/Physiological Data According to the Emotions　　**Seoul, Korea**

Main Researcher, 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.
- Performance: 1 publication, 1 proceeding.

Study on the Driver Behavior in Four Dangerous Situations　　　　　　　　　　　　**Seoul, Korea**

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.
- Performance: 2 publications, 2 proceedings.

AWARDS AND HONORS

- **Excellence Award**: 3rd, Competition of creating Intellectual Property Rights based on paper, Kookmin University, 2022.
- **Golden Award**: 2nd out of 38 students, poster competition of Brain Korea 21 program, Kookmin University, 2022.
- **Graduation Award**: 1st graduation out of 166 students, College of Automotive Engineering, Kookmin University, 2021.
- **Excellence Award**: 1st out of 6 teams, rubber-powered automotive manufacturing competition, 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)