DONGMIN KIM

RESEARCH INTERESTS

Secondary Battery, Battery Management System, Agentic AI, Physics-informed Modeling, Electric Vehicle, Energy Consumption Modeling, Auxiliary Energy Consumption Modeling, Battery Aging Modeling, Battery-in-the-Loop System (BILS), Probe Vehicle Data, Driving Efficiency

EDUCATION

Sep. 2025 ~	Post-doctoral Researcher in KAIST InnoCORE Platform for Real-world Innovation in Smart Manufacturing and AI, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea (PI: Prof. Namwoo Kang)
Mar. 2025 ~ Sep. 2025	Post-doctoral Researcher in Mechanical Engineering Research Institute, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea (PI: Prof. Yoon Koo Lee)
Mar. 2021 ~ Feb. 2025	Ph.D. Cho Chun Shik Graduate School of Mobility, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea **Dissertation:** The Analysis of Driving Characteristics on Internal Resistance Degradation in Electric Vehicle Battery (Advisor: Prof. Kitae Jang)
Mar. 2019 ~ Feb. 2021	M.S. Cho Chun Shik Graduate School of Mobility, Korea Advanced Institute of Science and Technology, Daejeon, Republic of Korea **Thesis:** The Guidance System of Driving Speed based on Real Driving Data for Saving the Driving Energy in Electric Vehicle (Advisor: Prof. Kitae Jang)
Mar. 2012 ~ Feb. 2018	B.S. School of Electrical and Electronics Engineering, Chung-Ang University, Seoul, Republic of Korea

PUBLICATIONS

Articles in International Journals

[1] **Kim, D.**, Lee, H., and Lee, J. (2025) Unsupervised Learning Approach for Risky Driving Behavior Identification on Expressways in C-ITS Environments. *IEEE Transactions on Intelligent Transportation Systems.* (SCIE, I.F. = 8.4), https://doi.org/10.1109/TITS.2025.3538929

[2] **Kim, D.**, and Jang, K. (2025) Component-Level Linear Mixed-effects Models for Real-time Energy Consumption Estimation in Battery Electric Vehicles under Driving Conditions, *eTransportation.* (SCIE, I.F. = 17.0), https://doi.org/10.1016/j.etran.2025.100472

[3] **Kim, D.**, Yun, G., Jang, K., and Woo, S. (2025) Auxiliary Energy Consumption of Electric Vehicles: Modeling and Prediction using Real-World Vehicle Data, *Applied Energy.,* (SCIE, I.F. = 11.0), https://doi.org/10.1016/j.apenergy.2025.126766

Article(s) under Review

[1] **Kim, D.**, and Yoon, J. Powertrain-Informed Macroscopic Energy Efficiency Analysis and System-Level Traffic Indicators for Electric Vehicle Fleets, Submitted to *IEEE Transactions on Transportation Electrification*., (SCIE, I.F. = 8.3) *Under 1st Review*

[2] **Kim, D.**, Oh, S., Ko, E., and Shim, J., Driving and Environmental Factors Affecting Lithium-Ion Battery Capacity Degradation in Micro Battery Electric Vehicles, Submitted to *eTransportation*., (SCIE, I.F. = 17.0) *Under 2nd Review*

Article(s) in Preparation

[1] **Kim, D.**, Lee, Y., and Jang, K., Vehicle-Level Modeling of Internal Resistance Degradation and Influential Parameter Analysis in Lithium-Ion Battery Packs Using Real-World Data

[2] **Kim, D.**, Lee, Y., and Jang, K., The Analysis of Driving Characteristics on Internal Resistance Degradation in Electric Vehicle Battery

[3] **Kim, D.**, Jang, Y., Kim, D., and Lee, Y., The Kalman Filter-Based State-of-Temperature Estimation of Lithium-ion Battery Considering Battery Degradation

Articles in Domestic Journals

[1] **Kim, D.**, Lee, H., and Lee, J. (2023), Empirical Analysis on Forward Collision Warning Situations under Heavy Vehicles' Expressway Driving Environment using C-ITS based Probe Vehicle Data, *International Journal of Highway Engineering, 25(6), 317-326.* (KCI)

[2] **Kim, D.**, and Shim, J. (2022), An Estimation Methodology of Empirical Flow-Density Diagram Using Vision Sensor-based Probe Vehicles' Time Headway Data, *The Journal of the Korea Institute of Intelligent Transportation Systems, 21(2), 17-32.* (KCI)

Articles in International Conference Proceedings

[1] **Kim, D.**, Ng, H., and Jang, K. (2022) The Analysis of Traffic Variables for EV's Driving Efficiency in Urban Traffic Condition, *The 25th IEEE International Conference on Intelligent Transportation Systems,* Macau, China.

[2] **Kim, D.**, Kim, D., Kang, H., and Jang, K. (2022) RL-based Traffic Signal Control in terms of Driving Efficiency in Electric Vehicles, *The 40th Anniversary International Conference of the Korean Society of Transportation & 10th International Public Transportation Forum*.

[3] **Kim, D.**, Lee, J., and Jang, K. (2022) Evaluating fatigue condition intensity of hazardous materials transport vehicles, *The KITS International Conference 2022*, ICC JEJU, Republic of Korea.

Articles in Domestic Conference Proceedings

[1] **Kim, D.**, Jang, K., and Lee, Y. (2025), Speed Control for Reducing Motor Current Consumption in BEVs under High-Speed Driving: A MATLAB-VISSIM Co-Simulation Study, *The 2025 Korean Society of Automotive Engineers (KSAE) Fall Academic Conference.,* JEJU, Republic of Korea.

[2] **Kim, D.**, Jang, K., and Lee, Y. (2025), Development of a Battery-in-the-Loop Based Simulator for Testing Electric Autonomous Vehicles, *The 2025 Korean Society of Automotive Engineers (KSAE) Spring Academic Conference.,* JEJU, Republic of Korea.

[3] Leen, A. and **Kim, D.** (2025), Two-Level Traffic Condition and Pattern Recognition Using K-Means Clustering, *The 2025 Korea Institute of ITS Spring Conference.,* JEJU, Republic of Korea.

[4] **Kim, D.**, and Jang, K. (2025), Development of a battery simulation for electric vehicle lifecycle testing considering road and traffic conditions, *The 2025 Korea Institute of ITS Spring Conference.,* JEJU, Republic of Korea.

[5] **Kim, D.**, Lee, Y., and Jang, K. (2025), Development of a Battery-in-the-Loop System for Battery Performance Testing Under Realistic Driving Environments, *The 2025 Spring Academic Conference: CAE and Applied Mechanics Division,* Korean Society of Mechanical Engineers*,* JEJU, Republic of Korea.

[6] **Kim, D.**, Yoon, J., and Jang, K. (2024) Development of Driving Efficiency Index under Traffic with Multiple Electric Vehicles Using Co-simulation, *The 2024 Korea Institute of ITS Spring Conference.,* JEJU, Republic of Korea.

[7] Kim, S., Lee, G., Kang, M., Ko, Y., **Kim, D.**, and Rhim, C. (2023) A Study on Charging State and Capacity Decrease of the Electric Vehicles' Batteries Using Their Actual Driving Data, *The 2023 Conference of Korea Institute of Electrical Engineers.*

[8] **Kim, D.**, Lee, J., Lee, H., and Jang, K. (2022) C-ITS based Probe Data Analysis of Driving Aggressiveness in Public Transit Vehicles, *The 2022 Korea Institute of ITS Fall Conference*

[9] Lee, J., Lee, H., **Kim, D.**, and Jang, K. (2022) A Study on the Criteria for Detecting Aggressive Driving Behavior Using In-Vehicle Driving Recorder, *The 2022 Korea Institute of ITS Fall Conference*

[10] Ng, H., **Kim, D.**, and Jang, K. (2022) Electric Vehicle Energy Consumption based on Real-World Traffic Condition Using Long-Short Term Memory (LSTM): A Case Study in Jeju, South Korea, *The 86th Conference of Korea Society of Transportation.*

[11] **Kim, D.**, Chai, S., and Jang, K. (2022) The Methodology for Analyzing Input Parameters in Prediction Model of Individual Vehicle's Speed Profile in Short Terms, *The 86th Conference of Korea Society of Transportation.*

[12] Ng, H., **Kim, D.**, and Jang, K. (2021) Data-driven Analysis of Electric Vehicle's Battery Internal Resistance in Real Traffic Condition, *The 85th Conference of Korea Society of Transportation.*

[13] **Kim, D.**, Chai, S., Kang, H., Lee, S. and Jang, K. (2021) Deep Learning-based Prediction of the Travel Speed for Short Term on an Arterial Road, *The 85th Conference of Korea Society of Transportation.*

HONORS AND AWARDS

Apr. 2025	Best Paper Award, *The 40th Korean Institute of Intelligent Transport Systems*.
Dec. 2023	The Grand Award, *The 1st Start-up Idea Competition of Cho Chun Shik Graduate School of Mobility*
Oct. 2023	Achievement Award, *Cho Chun Shik Graduate School of Mobility*
Feb. 2023	The KITS President's Award, *The Korea Institute of Intelligent Transport Systems*.
Sep. 2022	Best Paper Award, *The 40th Anniversary International Conference of the Korean Society of Transportation & 10th International Public Transportation Forum*.
July. 2020	The 1st Prize, *2020 KAIST ESV JEJU CAMP*

PATENTS

Kim, D., and Jang, K. (2025) APPARATUS AND METHOD OF MANAGING BATTERY STATE BASED ON REAL BATTERY RECHARGING DATA, Korean Patent No. 10-2023-0168297, Patent Application

Kim, D., Lee, Y., and Jang, K. (2025) ELECTRIC VEHICLE REAL-WORLD DRIVING PERFORMANCE SIMULATION SYSTEM AND ITS OPERATION METHOD., Korean Patent No. 10-2025-0138080, Patent Pending

Kim, D., Lee, H., and Jang, K. (2024) CHARGING WAITING TIME INFORMATION SYSTEM., Korean Patent No. 10-2024-0030858, Patent Pending

PRESENTATIONS

Seoul, Korea Jul. 2025	2025 dSPACE (Invited) - *Development of Energy Efficiency Indicators for Battery Electric Vehicle Fleets Using Vehicle-Traffic Co-simulation Based on ASM*
Jeju, Korea Apr. 2025	2025 Korean Society of Mechanical Engineers Spring Conference (Invited) - *Development of a Battery-in-the-Loop System for Battery Performance Testing Under Realistic Driving Environments*
Seoul, Korea Apr. 2025	MATLAB EXPO 2025 Korea - *Development and Application of an Electric Vehicle Driving Energy Analysis Simulator Considering Driving Environment Scenarios*
Jeju, Korea Apr. 2024	The Korean Society of Intelligent Transport Systems (KITS) Conference 2024 - *Development of driving efficiency index under traffic with multiple electric vehicles using Co-simulation*

Macau, China Oct. 2022	2022 IEEE 25th International Conference on Intelligent Transportation Systems - *The Analysis of Traffic Variables for EV's Driving Efficiency in Urban Traffic Condition*
Seoul, Korea Sep. 2022	The 40th Anniversary International Conference of the Korean Society of Transportation & 10th International Public Transportation Forum - *RL-based Traffic Signal Control in terms of Driving Efficiency in Electric Vehicles*
Jeju, Korea Jun. 2022	The Korean Society of Intelligent Transport Systems (KITS) International Conference 2022 - *Evaluating fatigue condition intensity of hazardous materials transport vehicles*

CERTIFICATED PROGRAM

Nov. 2023 ~ Dec. 2023 (10 days)	Advanced PBL: AI-Based Battery Systems for Eco-Friendly Vehicles (With Coding), Hyundai NGV, Seoul, Republic of Korea, Grade: 100
Mar. 2022 ~ Mar. 2022 (3 days)	Understanding Battery Systems for Eco-Friendly Vehicles, Hyundai NGV, Seoul, Republic of Korea, Grade: 100
Feb. 2022 ~ Feb. 2022 (4 days)	Vehicle Dynamics and Control Specialized for Electrification, Hyundai NGV, Seoul, Republic of Korea, Grade: 93
Aug. 2020 ~ Aug. 2020 (3 days)	Fundamentals of Driver Motor Design for Eco-Friendly Vehicles, Hyundai NGV, Seoul, Republic of Korea, Grade: 100
Jul. 2020 ~ Jul. 2020 (4 days)	Understanding In-Vehicle Communication Systems, Hyundai NGV, Seoul, Republic of Korea, Grade: 100
Feb. 2020 ~ Feb. 2020 (12 days)	[KEA] Introduction to Eco-Friendly Vehicle System Analysis and Control for Electric Vehicle System Design, Hyundai NGV, Seoul, Republic of Korea, Grade: 100