Jeu Shin

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EDUCATION

Mar. 2020 ~ Aug. 2024 — **Hanbat National University**, Department of Mechanical Engineering, Daejeon, Korea

B.S. in Mechanical Engineering
GPA: 3.65 / 4.5

RESEARCH INTERESTS

- Li-Ion Battery & Next-generation Batteries (e.g., All-solid-state Battery, Li-metal Battery, K-Ion Battery, etc.)
- Multi-Scale Approaches & Multi-Physics Analysis
- Battery Degradation
- Battery Safety
- Battery Optimization

PUBLICATIONS (SCIE/ESCI)

1. **J. Shin**, Y.K. Lee, "Multi-scale mechanical-electrochemical coupled modeling of stress generation and its impact on different battery cell geometries", *Jorunal of Power Sources **(IF: 8.1)***, 595 (2024) 234064, https://doi.org/10.1016/j.jpowsour.2024.234064.
2. **J. Shin**, Y. Jang, D. Kim, D.W. Kim, Y.K. Lee, "Development of an accelerated side reaction-electrochemical coupled modeling for lithium-ion batteries with the non-uniform time scale acceleration protocol", (In Preparation)
3. D. Lee†, U. Lee†, **J. Shin**, Y.K. Lee*, and N. Kang*, “Multi-scale & multi-physics design optimization for shared autonomous electric vehicle system considering dynamic battery degradation”, (In Preparation)

CONFERENCES

1. **J.Shin**, Y.K. Lee, "Study on the impact of the geometric shape of lithium-ion battery on mechanical and electrochemical performance," 2023 Spring Academic Conference, CAE and Applied Mechanics Division, Korean Society of Mechanical Engineers, May 2023.
2. **J. Shin**, Y.K. Lee, “Impact of battery structural geometry on battery performance: A mechanical-electrochemical performance analysis,” 2024 Spring Academic Conference, Chungcheong Branch, Korean Society of Mechanical Engineers, Jun 2024.

3. **J.Shin**, Y.K. Lee, “Development of an Accelerated Simulation Model for Predicting Degradation and Optimizing Performance of Lithium-Ion Batteries”, 2024 Fall Academic Conference, CAE and Applied Mechanics Division, Korean Society of Mechanical Engineers, Nov. 2024.
4. **J. Shin**, Y.K. Lee, “Development of a Physics-Based Accelerated Degradation Model for Predicting Lithium-Ion Battery Degradation,” 2025 Spring Academic Conference, The Korean Electrochemical Society, Apr 2025.
5. Y. Jang, **J. Shin**, Y.K. Lee, “Phase-Field Modeling of Lithium Dendrite Growth Morphology Depending on Surface Patterning in Li-Metal Batteries,” 2025 Spring Academic Conference, The Korean Electrochemical Society, Apr 2025.

RESEARCH EXPERIENCES

- Researcher (Part Time, Contract) at Department of Cho Chun Shik Graduate School of Mobility, Korea Advanced Institute of Science and Technology (KAIST), Korea (Sep. 2024 ~ Present) / Development of an accelerated battery degradation model
- Research Intern at Department of Cho Chun Shik Graduate School of Mobility, Korea Advanced Institute of Science and Technology (KAIST), Korea (May. 2024 ~ Aug. 2024) / Development of a battery degradation model
- Research Student at Department of Mechanical Engineering, Hanbat National University, Korea (Feb. 2022 ~ Feb. 2024) / Lithium-ion battery analysis

PATENTS

1. **J. Shin**, Y.K. Lee | 2025-06-12, 10-2025-0076896 “Accelerated Lithium-Ion Battery Degradation Prediction Method Through Control of Side Reaction Rate, Prediction System Utilizing Said Method, and Computer-Readable Recording Medium”

AWARDS AND HONORS

- **국립대학 육성사업 학생융합연구동아리(HaIM) 우수결과보고서 심사 우수상**, Hanbat National University, Korea (Jan. 2024)
- **12회 창의적 개념설계 공모전 은상**, Hanbat National University, Korea (Dec. 2020)

PROJECTS

- **리튬 이온 전지의 멀티 스케일 기계적 거동 분석 실험 및 해석 기술 개발**, **한국연구재단(과기정통부)**, Korea / student researcher (May. 2022 ~ Sep. 2022)
- **리튬 이온 전지의 멀티 스케일 기계적 거동 분석 실험 및 해석 기술 개발**, **한국연구재단(과기정통부)**, Korea / student researcher (Mar. 2023 ~ Feb. 2024)

SKILLS AND TECHNIQUES

- COMSOL Multiphysics
- CATIA
- MATLAB
- Python