

## **EDUCATION**

### **Doctor of Philosophy in Aerospace Engineering**

Chosun University, Gwangju, Republic of Korea

Advisor: Assoc. Prof. Sunghun Jung, Department of Aerospace Engineering, Chosun University

*Thesis:*

Feb 2029

GPA: 4.5 / 4.5

### **Master of Science in Smart Vehicle System Engineering**

Chosun University, Gwangju, Republic of Korea

Advisor: Assoc. Prof. Sunghun Jung, Department of Aerospace Engineering, Chosun University

*Thesis:* Development and Verification of the Four-layered SOC and SOH Estimation Algorithms

Aug 2025

GPA: 4.25 / 4.5

### **Bachelor of Science in Electronics Engineering**

Chosun University, Gwangju, Republic of Korea

Feb 2023

GPA: 3.9 / 4.5

## **RESEARCH INTEREST**

- Battery SOC/SOH estimation: Developing and comparing methods for estimating battery states (SOC and SOH) using charge-discharge cycling data
- Emergency decision support for UAM: Battery-state-aware reachability boundary updating and maintenance of an emergency landing (vertiport) candidate list

## **PROFESSIONAL EXPERIENCE**

### **TMC Co., Ltd., Engineer**

May 2023 – Aug 2023

- Researched solid-state battery cell-to-module and module-to-pack packaging concepts, including module configuration and pack-level architecture design

## **PUBLICATON (Journal, SCIE)**

- W. Zegeye, S. K. Jeong, H. Y. Park, G. Teklay, **E. Kim**, G. Teklay, S. Kim, A. Tullu, and S. Jung\*, Battery-Integrated AUV SOC Analysis Using Model-Based Nonlinear PID Controller with Disturbance Observer, IEEE Access, vol. 13, pp.190317-190332, 2025 (ISSN 2169-3536) (20251030, IF: 3.4, Q2, 65.4%)
- **E. Kim**, S. Kim, and S. Jung\*, Battery SOC and SOH Estimation Based on Sage-Husa Extended Kalman Filter and Feedforward Neural Network, IEEE Access, vol. 13, pp.174044-174056, 2025 (ISSN 2169-3536) (20251006, IF: 3.4, Q2, 65.4%)
- **E. Kim** and S. Jung\*, Battery State of Health Estimation Methods: Implementation and Comparison of 11 Algorithms, IEEE Access, vol. 13, pp. 55599-55615, 2025 (ISSN 2169-3536) (20250328, IF: 3.4, Q2, 65.4%)

## **PUBLICATIONS (Journal, Non-KCI)**

- **E. Kim** and S. Jung\*, Comparative Analysis of Seven Algorithms for Enhanced UAV Battery Health Estimation Accuracy, Space Note, vol.1, no.1, pp.14-23, Jun. 2024.

## **PUBLICATIONS (Conference)**

- S. Kim, **E. Kim**, and S. Jung\*, System-Level Optimization of Nonlinear MPC for Small Suborbital Reusable Launch Vehicle with Rocket and Jet Propulsion, Paper Presented at the 2025 Korean Society for Aeronautical and Space Sciences (KSAS) Fall Conference, Goseong, South Korea, Nov. 2025.
- **E. Kim** and S. Jung\*, Development and Verification of the Four-layered SOC and SOH Estimation Algorithms, Paper Presented at the 2025 Society for Aerospace System Engineering (SASE) Spring Conference, Yeosu, South Korea, May. 2025.
- G. Teklay, **E. Kim**, and S. Jung\*, A Study on Hydrodynamic Model and Anomaly Detection of Torpedo-shaped Autonomous Underwater Vehicle, Paper Presented at the 2025 Korean Society of Manufacturing Process Engineers (KSMPE) Spring Conference, Yeosu, South Korea, May. 2025.
- **E. Kim** and S. Jung\*, Comparison and Validation of Battery State of Health (SOH) Estimation Algorithm for UAV to Improve Flight Time Estimation Accuracy, Paper Presented at the 2024 Society for Aerospace System Engineering (SASE) Spring Conference, Gyeongju, South Korea, May. 2024.

### **PUBLICATIONS (Non-Conference)**

- **E. Kim** and S. Jung\*, A Comparative Analysis of 9 Algorithms for Improved Accuracy in Estimating the State of Health of UAV Batteries, Presented at the 2024 Space Talk, Gwangju, South Korea, June. 2024.

### **PATENTS**

- S. Jung, **E. Kim** and H. Myung, Battery SOC Estimation System Based on Sage-Husa Extended Kalman Filter and Feedforward Neural Network (Under Review)
- S. Jung and **E. Kim**, System for Predicting FNN Battery State of Health Based Extended Kalman Filter, 10-2973726
- S. Jung and **E. Kim**, Apparatus for Diagnosing Degradation Based on Second Trend Analysis of Closed-Circuit Voltage and Open-Circuit Voltage, 10-2928661

### **AWARDS**

- The Society for Aerospace System Engineering (Spring Conference), Best Paper Award, Jinhan Kim (President), Jun 2025

### **TECHNICAL SKILLS**

- Programming: MATLAB/Simulink