

Seunghyun Joo

Master's Student in Aerospace Engineering

Seoul, South Korea | Seoul National University

chlrh45351@gmail.com | seunghyun-joo.github.io/

EDUCATION	Seoul National University (SNU) - Seoul, South Korea • M.S. in Aerospace Engineering • Aerospace Vehicle Design Laboratory (AVDL) • GPA: 4.16 / 4.30 • Expected graduation: August 2026	2024/09 - Present
	Seoul National University (SNU) - Seoul, South Korea • B.S. in Aerospace Engineering • B.B.A. in Business Administration (Double Major) • Honors: Summa Cum Laude • GPA: 3.90 / 4.30 • Leave of absence for mandatory military service in the Republic of Korea Army (ROKA) (2019/08 - 2021/03)	2018/03 - 2024/08
	Nanyang Technological University (NTU) - Singapore • Exchange Student	2022/01 - 2022/05
RESEARCH INTERESTS	Research Areas • Aerodynamic analysis and computational fluid dynamics • Turbulence and transition modeling • Physics-informed machine learning for fluid dynamics • Data-driven modeling and flow-field reconstruction • eVTOL aerodynamics • Multidisciplinary analysis and design optimization (MDO)	
RESEARCH EXPERIENCE	Aerospace Vehicle Design Laboratory (AVDL), Seoul National University, Master's Researcher <i>Advisor: Prof. Kwanjung Yee</i> • Conduct research on data-driven turbulence and transition modeling, with an emphasis on incorporating physical mechanisms into predictive models. • Develop and validate computational workflows for multi-fidelity aerodynamic analysis, spanning low-fidelity conceptual design methods to higher-fidelity simulation environments. • Contribute to generalized aircraft modeling and multidisciplinary design frameworks for aerospace vehicle analysis and optimization. • Participate in collaborative research related to eVTOL aerodynamics, conceptual design tools, and integrated simulation environments for next-generation aircraft.	2024/09 - Present
	Undergraduate Research Opportunity Program (UROP), Seoul National University, Undergraduate Researcher <i>Advisor: Prof. Kyoungdoug Min</i> • Conducted undergraduate research on battery equivalent circuit model parameter extraction using HPPC data.	2024/01 - 2024/02

- Built and analyzed a 2-RC Thevenin equivalent circuit model for lithium-ion batteries and derived model equations for pulse and relaxation segments.
- Applied and compared multiple parameter estimation and optimization methods, including least-squares optimization, particle swarm optimization, and genetic algorithm.
- Used MATLAB for curve fitting, optimization, and numerical analysis to estimate resistance and capacitance parameters across SOC conditions.

**TEACHING
EXPERIENCE**

Seoul National University

2025 Spring

Teaching Assistant, Digital Computer Concept and Practice

- Assisted undergraduate students in digital logic and computer systems through hands-on practice sessions.
- Supported laboratory exercises, implementation tasks, debugging, and evaluation assistance.

**SELECTED
PUBLICATIONS**

1. **Seunghyun Joo**, Younghyo Kim, and Kwanjung Yee. Data-Driven Algebraic Turbulence Transition Modeling via Hierarchical Separation of Physical Transition Mechanisms (in Korean). KSAS Spring Conference 2026, 2026.
2. Jeonghwan Kim, Seongjoong Park, Berenice Chatelain, Seonghyun Jeong, Jaehyun Ryu, **Seunghyun Joo**, and Kwanjung Yee. AMADEVS: A Generalized Aircraft Modeling & Analysis Environment for Multidisciplinary Design. AIAA SCITECH 2026 Forum, 2026.
3. Heesang Shin, Younghyo Kim, **Seunghyun Joo**, and Kwanjung Yee. Development and Validation of a Low-Fidelity Analysis Tool for Conceptual Design Accounting for Anti-Icing Energy Requirement (in Korean). KSAS Fall Conference 2025, 2025.
4. Juneyoung Lim, **Seunghyun Joo**, and Kwanjung Yee. Downwash/Outwash Analysis of eVTOL Configurations Using the Lattice-Boltzmann Method. APISAT 2025, 2025.
5. Juneyoung Lim, **Seunghyun Joo**, and Kwanjung Yee. Analysis of Downwash/Outwash Characteristics of eVTOL Configurations Using the Lattice Boltzmann Method (in Korean). KSCFE Spring Conference 2025, 2025.
6. Jeonghwan Kim, Seongjoong Park, Seonghyun Jeong, **Seunghyun Joo**, Jaehyun Ryu, and Kwanjung Yee. A Generalized Modeling Architecture for Aircraft Multidisciplinary Analysis and Design (in Korean). KSAS Spring Conference 2025, 2025.
7. Taemin Jeong, Soonmyeong Kwon, Kwanghoon Yang, **Seunghyun Joo**, and Kwanjung Yee. SNU-TIMPANI: Integrated Tool for Noise Prediction and Propagation for Vertical Takeoff and Landing Aircraft (in Korean). KSAS Fall Conference 2024, 2024.

**SELECTED
PROJECTS**

Integrated M&S Framework for Next-Generation High-Speed Rotorcraft

- Contributed to the development of an integrated modeling and simulation environment for advanced rotorcraft sizing and design studies.
- Worked on aerodynamic analysis components and broader design workflow integration for conceptual and preliminary-level investigation.

AMADEVS: Generalized Aircraft Modeling & MDO Framework

- Participated in the development of a generalized aircraft modeling environment for multidisciplinary analysis and design.
- Contributed to aerodynamic analysis capabilities and integrated workflows for aircraft configuration studies and optimization.

eVTOL Downwash/Outwash Analysis using LBM

- Investigated aerodynamic characteristics of multiple eVTOL configurations using the Lattice-Boltzmann Method.
- Analyzed downwash/outwash behavior and near-ground effects to support improved early-stage design assessment.

**HONORS &
SCHOLARSHIPS**

BK21 FOUR Scholarship, Seoul National University

- Recipient of graduate research scholarship support under the BK21 FOUR program.
(2024 Fall, 2025 Fall)

Global Leadership Program Scholarship, College of Engineering, Seoul National University

2022 Spring

- Awarded in support of exchange study preparation and participation.

Academic Excellence Scholarship, Seoul National University

- Awarded for outstanding academic performance during undergraduate study
(2019 Spring, 2021 Fall, 2022 Fall, 2023 Spring)

Kiwoom Securities University Investment Competition

2022/07 - 2022/08

- Award recipient; achieved 82.21% return over 6 weeks and received a KRW 1,000,000 award.

**ADDITIONAL
EXPERIENCE**

WorldQuant

2022/09 - Present

Research Consultant

- Advanced to Stage 2 of the global quant competition and continued as a research consultant.
- Gained experience in data-driven research, quantitative idea generation, and analytical problem solving.

Compassion

2022/02 - 2023/02

Volunteer Translator

- Translated sponsor letters between Korean and English for an international child sponsorship organization.

SKILLS

Programming & Technical Tools

Python, Fortran, C++, PowerFLOW, OpenFOAM

Research & Engineering Areas

Aerodynamic analysis, CFD, Lattice-Boltzmann Method (LBM), data-driven modeling, turbulence and transition modeling, multidisciplinary design optimization (MDO)