

EDUCATION

Doctor of Philosophy in Smart Vehicle System Engineering

Expected Feb 2028

Chosun University, Gwangju, Republic of Korea

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

Thesis: Control Co-Design for a Reusable Launch-Vehicle-Based UAV (TBD)

Master of Science in Smart Vehicle System Engineering

Feb 2023

Chosun University, Gwangju, Republic of Korea

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

Thesis: A HIL test for verification of attitude control system of rocket-based UAV

Bachelor of Science in Aerospace Engineering

Aug 2021

Chosun University, Gwangju, Republic of Korea

RESEARCH INTEREST

- Control Co-Design and MDO: Plant-controller co-optimization within a multidisciplinary design optimization (MDO) framework for Uncrewed Aerial Vehicles (UAVs) and Reusable Launch Vehicles (RLVs), integrating hardware and control design to enhance cost efficiency, performance, and safety
- Guidance, Navigation, and Control (GNC): Trajectory optimization of UAVs and RLVs under operational constraints for precise and fuel-efficient flight
- Cooperative Control: Precision landing of UAVs and RLVs on Uncrewed Surface Vehicles (USVs), enabling coordinated touchdown and capture on moving maritime platforms

PROFESSIONAL EXPERIENCE

Unmanned System / Unmanned System Co., Ltd, CTO

Oct 2021 – Present

- Co-developed an RLV-UAV system for multipurpose missions (10% shareholder)

Maker-furniture (Startup Company), CEO

Nov 2016 – Dec 2017

- Developed a 3D printer integrated with an online platform for 3D model organization, sharing, and design

PUBLICATIONS (Journal, SCIE and SCOPUS)

1. **S. Kim**, A. Tullu, and S. Jung*, Enhancing Sensor Accuracy in Mobile Multi-sensor Systems for Atmospheric Monitoring Using Disturbance Observer and Sensor Estimators, *Frontiers in Marine Science*, vol. 12, 1671083, 2025 (ISSN 2296-7745) (23/10/2025, IF: 3.0, Q1, 88.8%).
2. **S. Kim**, T. Molla, A. Zegeye, and S. Jung*, Energy-Efficient Control System for Small-Scale Rocket Recovery, *IEEE Access*, vol. 13, pp. 104521–104537, 2025 (EISSN 2169-3536) (13/06/2025, IF: 3.4, Q2, 65.4%).
3. **S. Kim**, A. Tullu and S. Jung*, Linearized State-Space Model-Based Attitude Control for Rocket with Four Controllable Fins—Part 1-1: Basic Modeling and Identification, *IEEE Access*, vol. 11, pp. 146014–146029, 2023 (EISSN 2169-3536) (30/11/2023, IF: 3.4, Q2, 65.4%).
4. **S. Kim**, O. A. Philip, A. Tullu and S. Jung*, Development and Verification of a ROS-Based Multi-DOF Flight Test System for Unmanned Aerial Vehicles, *IEEE Access*, vol. 11, pp. 37068–37081, 2023 (EISSN 2169-3536) (14/04/2023, IF: 3.4, Q2, 65.4%).
5. A. Zegeye, S. Jeong, H. Park, 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 (30/10/2025, IF: 3.4, Q2, 65.4%).
6. 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 (30/10/2025, IF: 3.4, Q2, 65.4%).

PUBLICATIONS (Journal, Non-KCI)

1. K. Baek, **S. Kim**, and S. Jung*, Validation of a Nonlinear Dynamic Model Considering the Aerodynamic Coefficient of a Tandem-Wing UAV with Adjustable Wing Deployment Angle, *Space Note*, vol. 3, no. 1, pp. 1–8, Jun. 2026. DOI: 10.23261/SPACENOTE.2026.3.1.59394.
2. T. Molla, **S. Kim**, A. Zegeye, and S. Jung*, Thrust Vector Control and Reaction Gas Control Methods for Enhanced Rocket Landing: Nonlinear Dynamics and Control Design, *Space Note*, vol. 1, no. 1, pp. 24–40, Jun. 2024. DOI: 10.23261/SPACENOTE.2024.1.1.45293.

PUBLICATIONS (Conference)

1. **S. Kim**, J. Yoon, and S. Jung*, Development and Validation of a Jet-Engine Thrust Vector Control Model for a Small Reusable High-Altitude Launch Vehicle. Paper presented at the 2026 Korean Society for Aeronautical and Space Sciences (KSAS) Spring Conference, Jeju, South Korea, Apr. 2026.
2. **S. Kim**, E. Kim, and S. Jung*, System-Level Optimization Study of Nonlinear Controllers Considering Model Mismatch for Rocket- and Jet-Propulsion-Based Micro-Suborbital Reusable Launch Vehicles. Poster presented at the 2025 Korean Society for Aeronautical and Space Sciences (KSAS) Fall Conference, Goseong, South Korea, Nov. 2025.
3. **S. Kim**, E. Park, Y. Jo, K. Baek, and S. Jung*, System-Level Optimization and Validation of a Small Suborbital Launch Vehicle with Rocket and Jet Propulsion. Paper presented at the 2025 International Astronautical Congress (IAC), Sydney, Australia, Oct. 2025.
4. **S. Kim**, J. Kang, K. Baek, Y. Jo, and S. Jung*, Simulation-Based Design Optimization and Verification for Vertical Landing of a Small Reusable High-Altitude Launch Vehicle. Paper presented at the 2025 Society for Aerospace System Engineering (SASE) Spring Conference, Yeosu, South Korea, May 2025.
5. **S. Kim** and S. Jung*, Optimization of Throttle Control for Rocket Jet Complex Propulsion for Small Reusable High Altitude Launch Vehicles. Poster presented at the 2025 Korean Society for Aeronautical and Space Sciences (KSAS) Spring Conference, Jeju, South Korea, Apr. 2025.
6. **S. Kim**, A. Zegeye, T. Molla, M. Kim, E. Park, and S. Jung*, Fuel Efficiency Analysis of the Jet Engine and Solid-Propellant Based Small Reusable Sub-Orbital Launch Vehicle Candidates. Paper presented at the 2024 International Astronautical Congress (IAC), Milan, Italy, Oct. 2024.
7. **S. Kim** and S. Jung*, Deriving and Validating State Space Models for Optimal Thermal Design of Complex Environmental Sensors for High Altitude Unmanned Aerial Vehicles. Paper presented at the 2024 Society for Aerospace System Engineering (SASE) Spring Conference, Gyeongju, South Korea, May 2024.
8. **S. Kim** and S. Jung*, Development and Verification of the Linear State-Space Model for a Rocket Performing Wing Control Ballistic Flight. Paper presented at the 2023 Society for Aerospace System Engineering (SASE) Fall Conference, Jeju, South Korea, Oct. 2023.
9. **S. Kim** and S. Jung*, Sliding Mode Control Considering Stick-Slip Friction for Free Z-Axis Movement of the UAV Test Bench. Paper presented at the 2023 Society for Aerospace System Engineering (SASE) Fall Conference, Jeju, South Korea, Oct. 2023.
10. **S. Kim** and S. Jung*, Validation of Nonlinear Disturbance Observer-Based Attitude Controller for Rocket-Based Unmanned Aerial Vehicle Using Wind Tunnel. Paper presented at the 2023 Korean Society for Aeronautical and Space Sciences (KSAS) Spring Conference, Jeju, South Korea, Apr. 2023.
11. **S. Kim** and S. Jung*, Development of a ROS-based Flight Test System for Unmanned Aerial Vehicle. Paper presented at the 2022 Society for Aerospace System Engineering (SASE) Fall Conference, Yeosu, South Korea, Nov. 2022.
12. Y. Jo, **S. Kim**, and S. Jung*, Mission-Adaptive Wing Deployment Angle Optimization for Folding Tandem-Wing UAVs. Poster presented at the 2025 Korean Society for Aeronautical and Space Sciences (KSAS) Fall Conference, Goseong, South Korea, Nov. 2025.
13. K. Baek, **S. Kim**, and S. Jung*, Nonlinear Dynamic Modelling and Verification of a Tandem-Wing UAV Deployed in Flight. Poster presented at the 2025 Korean Society for Aeronautical and Space Sciences (KSAS) Fall Conference, Goseong, South Korea, Nov. 2025.
14. J. Kang, H. Myung, W. Na, **S. Kim**, and S. Jung*, Simulation and Real-World Validation to Address Landing Precision, Trajectory Interference, and Scalability in Cooperative UAV-UGV Swarms. Poster presented at the 2025 Korean Society for Aeronautical and Space Sciences (KSAS) Fall Conference, Goseong, South Korea, Nov. 2025.
15. A. Zegeye, **S. Kim**, and S. Jung*, Speed and Heading Control Based on Sliding Mode Controller of Unmanned Surface Vehicle Equipped with Robot Arm for VTVL Rocket Recovery in Ocean Environment. Paper presented at the 2024 Korean Society of Manufacturing Process Engineers (KSMPE) Spring Conference, Gwangju, South Korea, Apr. 2024.
16. T. Molla, **S. Kim**, and S. Jung*, Linear Quadratic Controller Design for Rocket Landing Using Thrust Vector Control and Reaction Gas Control Methods. Paper presented at the 2024 Korean Society for Aeronautical and Space Sciences (KSAS) Spring Conference, Jeju, South Korea, Apr. 2024.

PATENTS

1. S. Jung, **S. Kim**, Air quality measuring device, Jan. 2023.
2. S. Jung, **S. Kim**, Stepped support bracket and UAV using it, Sep. 2025.
3. S. Jung, **S. Kim**, Method for controlling the wind tunnel system, Dec. 2022.
4. S. Jung, **S. Kim**, Foldable fixed-wing unmanned aerial system based on small rocket propulsion system, Oct. 2023
5. S. Jung, **S. Kim**, 3-axis jig system of unmanned aerial vehicles, Dec. 2021.
6. S. Jung, **S. Kim**, Apparatus monitoring rocket propulsion, Jul. 2023.
7. S. Jung, **S. Kim**, Indoor vertical wind tunnel device for rocket propulsion testing, Oct. 2023.
8. S. Jung, **S. Kim**, Vertical wind tunnel apparatus for rocket vertical landing test, Oct. 2023.

COLUMNS

1. S. Jung*, **S. Kim**, SpaceX's Falcon 9 That Soars and Lands Gracefully — Now Replicable as a Test Platform by Korean Firm 'Unmanned System', AI Post, Dec 2023, <https://www.aipostkorea.com/news/articleView.html?idxno=725>
2. S. Jung*, **S. Kim**, Chosun University Presents Paper on Robotic System UAV... Proposing a Stable Development Method for Aerial Vehicles, AI Times, Jun 2023, <https://www.aitimes.com/news/articleView.html?idxno=151690>
3. S. Jung*, **S. Kim**, "We Will Develop the Ultimate 'Drone-Type Satellite Technology'" – Interview with Jung Sung-hoon, CEO of Unmanned System, AI Times, Jun 2022, <https://www.aitimes.com/news/articleView.html?idxno=145100>

HONORS, AWARDS, AND SCHOLARSHIPS

Chosun University

- The Korean Society of Manufacturing Process Engineers (Spring Conference), Best Paper Award, Dongkyu Ahn (President), Apr 2024

TECHNICAL SKILLS

- Programming: C, C++, Python, JavaScript, MATLAB/Simulink, Linux(Arch, Ubuntu)
- Analysis: CFD(Ansys Fluent), FEA(CATIA)
- Design: CAD(CATIA, AutoCAD), CAM(CATIA)
- Manufacturing: Manufacture Designing for 3D printing(Metal, Plastic), CNC, Milling, Lathe

REFEREES

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ACADEMIC MEMBERSHIP

- None

ACADEMIC PAPER REVIEWER

- None

LANGUAGE SKILLS

- Korean (Native)
- English (Fluently)