

Jeonghyun Byun, Ph.D.

POSTDOCTORAL RESEARCHER | FULBRIGHTER

Automation and Systems Research Institute (ASRI), Seoul National University, Seoul, Republic of Korea

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Education

Seoul National University

Seoul, Republic of Korea

PH.D. IN AEROSPACE ENGINEERING

2020.03.02 - 2025.02.26

- Dissertation: Aerial physical interaction strategy considering changes in dynamics
- Advisor: Prof. H. Jin Kim

Seoul National University

Seoul, Republic of Korea

B.S. IN AEROSPACE ENGINEERING

2016.03.02 - 2020.02.26

- Graduated **top of the department**
- Awarded Summa Cum Laude (GPA: 4.05/4.3)

Professional Experience

Institute of Control, Robotics and Systems (ICROS)

Seoul, Republic of Korea

EDITORIAL BOARD MEMBER

2026.01.01 -

Editorial Board Member of the Institute of Control, Robotics and Systems (ICROS)

Automation and Systems Research Institute (ASRI), Seoul National University

Seoul, Republic of Korea

POSTDOCTORAL RESEARCHER

2025.03.01 -

- **Alternative military service** as technical research personnel (25. 03. - 26. 02.)
- Supervisor: Prof. H. Jin Kim (PI)

Publications

MANUSCRIPTS UNDER REVIEW OR IN PREPARATION

Jeonghyun Byun¹, Yeonjoon Kim, Jaewoo Lee, and H. Jin Kim “Hybrid DOB-NMPC for Safe, Compliant and Versatile Aerial Physical Interaction”
In Preparation, IEEE Transactions on Robotics

Lin Yang¹, Jinwoo Lee, Domenico Campolo, H. Jin Kim, **Jeonghyun Byun**[†] “Whole-body motion planning and safety-critical control for aerial manipulation.”
Under review, Mechatronics, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=5954633

Jeonghyun Byun¹, Dongjae Lee, Dohyun Eom, H. Jin Kim. “Motion/force control against discontinuous contact and friction forces for aerial push-and-slide operation.”
Under Second Review, IEEE Transactions on Control Systems Technology

JOURNALS ARTICLES

Yongjae Lim¹, Youngmin Yoon, **Jeonghyun Byun**, Sangyoon Kim, and H. Jin Kim. “Reachable-Set-based Trajectory Sampling for Local Planning of Autonomous Vehicles.” **IEEE Access**, 2025

Yeongin Song¹, Hyunmin Kim¹, **Jeonghyun Byun**, Keun Park, Murim Kim, and Seung Jae Lee. “Aerial Dockable Multirotor UAVs: Design, Control and Flight Time Extension through In-flight Battery Replacement.” **IEEE Access**, 2025

Jeonghyun Byun¹, Junha Kim, Dohyun Eom, Dongjae Lee, Changhyeon Kim, H. Jin Kim. “Image Based Time-Varying Contact Force Control of Aerial Manipulator using Robust Impedance Filter.” *IEEE Robotics and Automation Letters (RA-L)*, 2024. (*Orally presented at IROS 2024 held in Abu Dhabi, UAE.)

Jeonghyun Byun¹, Inkyu Jang, Dongjae Lee, H. Jin Kim. “A Hybrid Controller Enhancing Transient Performance for an Aerial Manipulator Extracting a Wedged Object.” *IEEE Transactions on Automation Science and Engineering (T-ASE)*, 2023. (*Orally presented at ICRA 2024 held in Yokohama, Japan.)

Dongjae Lee¹, **Jeonghyun Byun**, H. Jin Kim. "RISE-based trajectory tracking control of an aerial manipulator under uncertainty." IEEE Control Systems Letters (**L-CSS**), 2022.

PEER-REVIEWED CONFERENCES

Jeonghyun Byun¹, Yeonjoon Kim, Dongjae Lee, H. Jin Kim. "Safety-Critical Control for Aerial Physical Interaction in Uncertain Environment." 2025 International Conference on Robotics and Automation (**ICRA**).

Jeonghyun Byun¹, Dohyun Eom, H. Jin Kim. "Haptic-Based Bilateral Teleoperation of Aerial Manipulator for Extracting Wedged Object with Compensation of Human Reaction Time." 2024 International Conference on Unmanned Aircraft Systems (**ICUAS**).

Dongjae Lee¹, Sunwoo Hwang, **Jeonghyun Byun**, H. Jin Kim. "Autonomous Aerial Perching and Unperching Using Omnidirectional Tiltrotor and Switching Controller." 2024 International Conference on Robotics and Automation (**ICRA**).

Inkyu Jang¹, Sunwoo Hwang, **Jeonghyun Byun**, H. Jin Kim. "Safe Receding Horizon Motion Planning with Infinitesimal Update Interval." 2024 International Conference on Robotics and Automation (**ICRA**).

Jeonghyun Byun¹, Byeongjun Kim, Changhyeon Kim, Donggeon David Oh, H. Jin Kim. "Stable Contact Guaranteeing Motion/Force Control for an Aerial Manipulator on an Arbitrarily Tilted Surface." 2023 International Conference on Robotics and Automation (**ICRA**).

Byeongjun Kim¹, Dongjae Lee, **Jeonghyun Byun**, H. Jin Kim. "Globally Defined Dynamic Modelling and Geometric Tracking Controller Design for Aerial Manipulator." 2023 International Conference on Robotics and Automation (**ICRA**).

Dongjae Lee¹, Inkyu Jang¹, **Jeonghyun Byun**, Hoseong Seo, H. Jin Kim. "Real-Time Motion Planning of a Hydraulic Excavator using Trajectory Optimization and Model Predictive Control." 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**).

Jeonghyun Byun¹, Dongjae Lee, Hoseong Seo, Inkyu Jang, Jeongjun Choi, H. Jin Kim. "Stability and Robustness Analysis of Plug-Pulling using an Aerial Manipulator." 2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**).

Projects

Autonomous Wheel Loader

HYUNDAI CONSTRUCTION EQUIPMENT (HCE)

South Korea

2023.03.01 - Present

(Leading the team of graduate students) Develop trajectory generation strategy for V-shape maneuver and loading/unloading of a wheel loader,

Research and Education on Defense Intelligent Swarm System

MINISTRY OF SCIENCE AND ICT

South Korea

2024.07.01 - 2025.12.31.

(Leading the team of graduate students) Proceed on control and planning of single and multiple unmanned aerial vehicles

Hybrid Motion/Force Controller for Underactuated Aerial Manipulator

BRAIN KOREA21 PLUS

South Korea

2021.12.01 - 2022.03.31

(Independent Research Project) Design a transient performance-enhancing hybrid motion/force controller for an underactuated multirotor equipped with added equipment

Friction Coefficient Estimation

HYUNDAI MOTORS

South Korea

2021.06.01 - 2022.05.01

Physically estimate friction coefficient between car's tire and road

Autonomous Excavator

HYUNDAI CONSTRUCTION EQUIPMENT (HCE)

South Korea

2020.09.01 - 2021.01.01

Design external wrench estimator for excavator path-planning

Invited Presentations

- 2025.11. **Aerial Physical Interaction Strategy Considering Changes in Dynamics**, Control and Dynamic Systems Lab, Sookmyung Women's University
- 2025.10. **Aerial Physical Interaction Strategy Considering Changes in Dynamics**, Workshop on Advanced Aerial Robotics at Dragon Lab, University of Tokyo
- 2025.10. **Safety-Critical Aerial Physical Interaction**, Advancements in Aerial Physical Interaction (Workshop) in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**)
- 2025.05. **Introduction to Drone Research in LARR (Korean)**, Seoul National University

Honors

AWARDS

- 2025.07 **Selected Paper for Journal Submission - 40th ICROS Annual Conference**, Institute of Control, Robotics and Systems (**ICROS**)
- 2022.11 **Third Prize, Aerospace Paper Award**, Korea Aerospace Industries (**KAI**), LTD.
- 2020.02 **Top Graduate Award**, Department of Aerospace Engineering, Seoul National University
- 2020.02 **Summa Cum Laude**, Department of Aerospace Engineering, Seoul National University
- 2018.09 **Special Recognition**, 7th SNU Creative Design Fair, College of Engineering, Seoul National University
- 2017.09 **Special Recognition**, 6th SNU Creative Design Fair, College of Engineering, Seoul National University

FELLOWSHIPS

- 2026.08 – 2027.07 **Fulbright Visiting Scholar Program (Postdoctoral Researcher)**, Fulbright Korea
- 2021.11 – 2022.02 **BK21 Excellent Research Talent Fellowship**, BrainKorea21PLUS
- 2020.03 – 2020.08 **BK21 PLUS Doctoral Fellowship**, BrainKorea21PLUS

Skills

Programming: C/C++, Python, ROS, ROS2, MATLAB/Simulink, Arduino

Language: Korean (native), English (proficient), French (elementary)

Tools: Git, CAD (Solidworks, Fusion360, Onshape), Optimization Toolbox/Solver (Acados, CasADi, CPLEX)

Academic Services

- **Journal reviewer for IJRR**, 2025
- **Journal reviewer for IEEE T-RO**, 2021, 2024
- **Journal reviewer for IEEE T-ASE**, 2023 - 2024
- **Journal reviewer for IEEE T-IE**, 2025
- **Journal reviewer for IEEE RA-L**, 2022 - 2026
- **Journal reviewer for Springer IJCAS**, 2023
- **Conference reviewer for IEEE ICRA**, 2022-2023, 2025
- **Conference reviewer for IEEE IROS**, 2023, 2025
- **Conference reviewer for IFAC World Congress**, 2026

Teaching Experiences

- 2021.03 -
2021.06 **Tutor, Engineering Maths 1, Seoul National University**, Solved several difficult problem sets
- 2020.09 -
2020.12 **TA, Introductory Engineering Probability, Seoul National University**, Developed scoring criteria for the exams
- 2020.09 -
2020.12 **Tutor, Physics 2, Seoul National University**, Solved several difficult problem sets
- 2020.03 -
2020.06 **TA, Engineering Maths 1, Seoul National University**, Developed scoring criteria for the exams
- 2017.03 -
2018.06 **Tutor, Physics, Seoul National University**, Solved some difficult problem sets

References

Prof. H. Jin Kim (Seoul National University, hjinkim@snu.ac.kr)

Prof. Domenico Campolo (Nanyang Technological University, d.campolo@ntu.edu.sg)

Prof. Seungjae Lee (Seoul National University of Science and Technology, seungjae_lee@seoultech.ac.kr)