

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

PH.D. IN AEROSPACE ENGINEERING

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

Seoul, Republic of Korea
March, 2020 - February, 2025

Seoul National University

B.S. IN AEROSPACE ENGINEERING

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

Seoul, Republic of Korea
March, 2016 - February, 2020

Professional Experience

University of Pennsylvania

VISITING SCHOLAR (POSTDOC)

- **Partially Funded by Fulbright** (August, 2026 - July, 2027)
- P.I.: Prof. Vijay Kumar

Philadelphia, Pennsylvania, USA
August, 2026 -

Institute of Control, Robotics and Systems (ICROS)

EDITORIAL BOARD MEMBER

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

Seoul, Republic of Korea
January, 2026 -

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

POSTDOCTORAL RESEARCHER

- **Alternative military service** as technical research personnel (March 2025 - February 2026)
- P.I.: Prof. H. Jin Kim

Seoul, Republic of Korea
March, 2025 - July, 2026

Publications

MANUSCRIPTS UNDER REVIEW OR IN PREPARATION

Jeonghyun Byun¹, Yeonjoon Kim, Jaewoo Lee, and H. Jin Kim “Low Complexity Robust Controller for Diverse Types of Forceful and Compliant Input Constrained Aerial Manipulation”
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

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 2nd 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

Yubin Kim¹, Jinwoo Lee, Yongjun You, H. Jin Kim, **Jeonghyun Byun**[†]. "Safety-Critical Bilateral Teleoperation for Omnidirectional Aerial Manipulation Using Force-Sensorless Haptic Feedback." 2026 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**).

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

South Korea

HYUNDAI CONSTRUCTION EQUIPMENT (HCE)

March, 2023 - 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

South Korea

MINISTRY OF SCIENCE AND ICT

July, 2024 - December, 2025

(Led 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

South Korea

BRAIN KOREA21 PLUS

December, 2021 - March, 2022

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

Friction Coefficient Estimation

South Korea

HYUNDAI MOTORS

June, 2021 - May, 2022

Physically estimate friction coefficient between car's tire and road

Autonomous Excavator

HYUNDAI CONSTRUCTION EQUIPMENT (HCE)

Design external wrench estimator for excavator path-planning

South Korea

September, 2020 - January, 2021

Invited Presentations

- 2025 **Aerial Physical Interaction Strategy Considering Changes in Dynamics**, Control and Dynamic Systems Lab, Sookmyung Women's University
- 2025 **Aerial Physical Interaction Strategy Considering Changes in Dynamics**, Workshop on Advanced Aerial Robotics at Dragon Lab, University of Tokyo
- 2025 **Safety-Critical Aerial Physical Interaction**, Advancements in Aerial Physical Interaction (Workshop) in IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**)
- 2025 **Introduction to Drone Research in LARR (Korean)**, Seoul National University

Honors

AWARDS

- July, 2026 **2026 MathWorks Application Award List**, Institute of Control, Robotics and Systems (**ICROS**)
- Feb., 2026 **Promotional Prize Winner in 2025 Best Video Award**, **IEEE Access**
- July, 2025 **Selected Paper for Journal Submission - 40th ICROS Annual Conference**, Institute of Control, Robotics and Systems (**ICROS**)
- Nov., 2022 **Third Prize, Aerospace Paper Award**, Korea Aerospace Industries (**KAI**), LTD.
- Feb., 2020 **Top Graduate Award**, Department of Aerospace Engineering, Seoul National University
- Feb., 2020 **Summa Cum Laude**, Department of Aerospace Engineering, Seoul National University
- Sep., 2018 **Special Recognition**, 7th SNU Creative Design Fair, College of Engineering, Seoul National University
- Sep., 2017 **Special Recognition**, 6th SNU Creative Design Fair, College of Engineering, Seoul National University

FELLOWSHIPS

- Aug., 2026 **Fulbright Visiting Scholar Program (Postdoctoral Researcher)**, Fulbright Korea
- Nov., 2021 **BK21 Excellent Research Talent Fellowship**, BrainKorea21PLUS
- Mar., 2020 **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, 2025-2026
- **Conference reviewer for IFAC World Congress**, 2026

Teaching Experiences

- 2026 **Instructor, Intelligent Autonomous Vehicle Operation Practicum, Seoul National University**, Instructed undergraduate and graduate students on compact drone operation and control
- 2021 **Tutor, Engineering Maths 1, Seoul National University**, Solved several difficult problem sets
- 2020 **TA, Introductory Engineering Probability, Seoul National University**, Developed scoring criteria for the exams
- 2020 **Tutor, Physics 2, Seoul National University**, Solved several difficult problem sets
- 2020 **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)