Dongjae Lee

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Education

Seoul National University — *Seoul, South Korea*

Ph.D. in Aerospace Engineering — *Sep 2020 – Feb 2025*

- Advisor: Prof. H. Jin Kim
- Dissertation: nonprehensile aerial manipulation with robust stability guarantee
- Cumulative GPA: 4.05/4.30

Seoul National University — *Seoul, South Korea*

M.S. in Mechanical and Aerospace Engineering — *Sep 2018 – Aug 2020*

- Advisor: Prof. H. Jin Kim
- Thesis: opening a hinged door with an aerial manipulator using model predictive control
- Cumulative GPA: 4.19/4.30

Seoul National University — *Seoul, South Korea*

B.S. in Mechanical and Aerospace Engineering — *Mar 2014 – Feb 2018*

- Cumulative GPA: 3.82/4.30

Experiences

Collaborating Visitor (Incoming) — *Pittsburgh, United States*

Robotics Institute, Carnegie Mellon University — *Sep 2025 – Aug 2026 (Expected)*

- Advisors: Prof. Guanya Shi and Prof. Sebastian Scherer
- Financial support by **NRF Postdoctoral Fellowship for Overseas Training**

Postdoctoral Researcher — *Seoul, South Korea*

Seoul National University — *Mar 2025 – Aug 2025*

- Advisor: Prof. H. Jin Kim

Visiting PhD Student — *Stockholm, Sweden*

KTH Royal Institute of Technology — *Apr 2024 – Oct 2024*

- Advisor: Prof. Dimos V. Dimarogonas
- Financial support by **BK Fellowship for Outstanding Graduate Students Overseas Training**

Online Education Mentor — *Seoul, South Korea*

HOLIX (former: Educast) — *Dec 2017 – Jun 2018*

- Subject: engineering mathematics

Honors

Awards

2025	Outstanding Doctoral Dissertation Award	*Seoul National University, South Korea*
2024	BK Future Innovation Talent Award (Silver Prize)	*Seoul National University, South Korea*
2022	BK Aerospace Excellence Research Award	*Seoul National University, South Korea*
2021	**2021 ICRA Best Paper Award** on Unmanned Aerial Vehicles	*IEEE*
2020	2020 ICCAS Outstanding Paper Award	*ICROS, South Korea*

Fellowship

2025–2026	NRF Postdoctoral Fellowship for Overseas Training	*National Research Foundation, South Korea*
2024	BK Fellowship for Outstanding Graduate Student Overseas Training	*National Research Foundation, South Korea*
2022–2023	NRF Ph.D. Research Fellowship	*National Research Foundation, South Korea*
2021–2022	BK Research Fellowship	*Seoul National University, South Korea*
2016	National Scholarship	*Korea Student Aid Foundation, South Korea*

Projects

Multi-agent nonprehensile aerial manipulation — *United States*

Ministry of Education (MoE) — *Sep 2025 – Aug 2026 (Expected)*

- leading the project as a recipient of the **NRF Postdoctoral Fellowship for Overseas Training**
- learning-based trajectory optimization and constrained adaptive control

Short course on micro drone systems *South Korea*

Seoul National University *Mar 2025 – Aug 2025*

- organized a course as part of a regional talent development program, and **led a team of graduate students**

Tiltrotor design and collaborative transportation *South Korea*

Ministry of Education (MoE) *Jun 2022 – May 2023*

- led the project as a recipient of the **NRF Ph.D. Research Fellowship**
- platform design, control and experiments

Landscape inspection and motion planning for automating industrial excavator *South Korea*

Hyundai Construction Equipment (HCE) *Feb 2020 – Dec 2022*

- optimization-based motion planning and outdoor experiment

Precise aerial manipulation with autonomous drones *South Korea*

Ministry of Trade, Industry and Energy (MoTIE) *Feb 2020 – May 2020*

- outdoor experiment of cooperative aerial transportation

Development of specialized multirotor for transportation *South Korea*

Ministry of Trade, Industry and Energy (MoTIE) *Jan 2019 – Dec 2019*

- pick-and-place mechanism design and outdoor experiment

Publications

* indicates equal contributions

Journal Articles

[J1] Autonomous aerial manipulation at arbitrary pose in SE(3) with robust control and whole-body planning
D. Lee*, B. Kim*, H. J. Kim
The International Journal of Robotics Research **(IJRR)** *accepted*.

[J2] Autonomous heavy object pushing using a coaxial tiltrotor
S. Hwang*, **D. Lee***, C. Kim, H. J. Kim
IEEE Transactions on Automation Science and Engineering **(T-ASE)** *accepted*.

[J3] Towards Fully Integrated Autonomous Excavation: Autonomous Excavator for Precise Earth Cutting and Onboard Landscape Inspection
I. Jang*, J. Kim*, **D. Lee***, C. Kim*, C. Oh, Y. Kim, S. Woo, H. Sung, H. J. Kim
IEEE Robotics & Automation Magazine **(RAM)** *accepted*.

[J4] The palletrone cart: human-robot interaction-based aerial cargo transportation
G. Park, H. Park, W. Park, **D. Lee**, M. Kim, S. J. Lee
IEEE Robotics and Automation Letters **(RA-L)**, 2024.

[J5] Image-based time-varying contact force control of aerial manipulator using robust impedance filter
J. Byun, J. Kim, D. Eom, **D. Lee**, C. Kim, H. J. Kim
IEEE Robotics and Automation Letters **(RA-L)**, 2024.

[J6] Design, modeling and control of a top-loading fully-actuated cargo transportation multirotor
W. Park, X. Wu, **D. Lee**, S. J. Lee
IEEE Robotics and Automation Letters **(RA-L)**, 2023.

[J7] A hybrid controller enhancing transient performance for an aerial manipulator extracting a wedged object
J. Byun, I. Jang, **D. Lee**, H. J. Kim
IEEE Transactions on Automation Science and Engineering **(T-ASE)**, 2023.

[J8] RISE-based trajectory tracking control of an aerial manipulator under uncertainty
D. Lee, J. Byun, H. J. Kim
IEEE Control Systems Letters **(LCSS)**, 2022.

[J9] Aerial manipulator pushing a movable structure using a DOB-based robust controller
[2021 ICRA Best Paper Award on Unmannaed Aerial Vehicles]
D. Lee, H. Seo, I. Jang, S. J. Lee, H. J. Kim
IEEE Robotics and Automation Letters **(RA-L)**, 2021.

[J10] Fully actuated autonomous flight of thruster-tilting multirotor
S. J. Lee, **D. Lee**, J. Kim, D. Kim, I. Jang, H. J. Kim
IEEE/ASME Transactions on Mechatronics **(T-MECH)**, 2021.

Conference Proceedings

[C1] Safety-critical control for aerial physical interaction in uncertain environment
J. Byun, Y. Kim, **D. Lee**, H. J. Kim
2025 IEEE International Conference on Robotics and Automation **(ICRA)**, 2025.

[C2] Saturated RISE control for considering rotor thrust saturation of fully actuated multirotor
D. Lee, H. J. Kim
2024 International Conference on Unmanned Aircraft Systems **(ICUAS)**, 2024.

[C3] Autonomous aerial perching and unperching using omnidirectional tiltrotor and switching controller
D. Lee, S. Hwang, J. Byun, S. J. Lee, H. J. Kim
2024 IEEE International Conference on Robotics and Automation **(ICRA)**, 2024.

[C4] Safety-critical control under multiple state and input constraints and application to fixed-wing UAV
D. D. Oh*, **D. Lee***, H. J. Kim
2023 IEEE Conference on Decision and Control **(CDC)**, 2023.

[C5] Minimally actuated tiltrotor for perching and normal force exertion
D. Lee, S. Hwang, C. Kim, S. J. Lee, H. J. Kim
2023 IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS)**, 2023.

[C6] Globally defined dynamic modelling and geometric tracking controller design for aerial manipulator
B. Kim, **D. Lee**, J. Byun, H. J. Kim
2023 IEEE International Conference on Robotics and Automation **(ICRA)**, 2023.

[C7] Stability and robustness analysis of plug-pulling using an aerial manipulator
J. Byun, **D. Lee**, H. Seo, I. Jang, J. Choi, H. J. Kim
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS)**, 2021.

[C8] Real-time motion planning of a hydraulic excavator using trajectory optimization and model predictive control
D. Lee*, I. Jang*, J. Byun, H. Seo, H. J. Kim
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS)**, 2021.

[C9] Robust and recursively feasible real-time trajectory planning in unknown environments
I. Jang, **D. Lee**, S. Lee, H. J. Kim
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems **(IROS)**, 2021.

[C10] Aerial manipulation using model predictive control for opening a hinged door
D. Lee, H. Seo, D. Kim, H. J. Kim
2020 IEEE International Conference on Robotics and Automation **(ICRA)**, 2020.

[C11] Trajectory planning with safety guaranty for a multirotor based on the forward and backward reachability analysis
H. Seo, C. Y. Son, **D. Lee**, H. J. Kim
2020 IEEE International Conference on Robotics and Automation **(ICRA)**, 2020.

[C12] Cargo transportation strategy using T 3-Multirotor UAV
S. J. Lee, **D. Lee**, H. J. Kim
2019 IEEE International Conference on Robotics and Automation **(ICRA)**, 2019.

Manuscripts under review / in preparation

[M1] Aerial physical interaction with robust stability guarantee against sudden collision and contact-loss
D. Lee, J. Byun, H. J. Kim
under review (*journal submission*).

[M2] Switching control of underactuated multi-channel systems with input constraints for cooperative manipulation
D. Lee, D. V. Dimarogonas, H. J. Kim
under review (*journal submission*).

Invited Presentations

- **Robust Nonprehensile Aerial Manipulation** — *Korea Institute for Advanced Study* (*KIAS*), *South Korea*, *Feb 2025*
  2025 KIAS mini workshop on AI and Robotics
- **Nonprehensile pushing manipulation from pusher and object perspectives** — *SeoulTech, South Korea*, *Nov 2024*
  Robotics group in Dept. of mechanical system design engineering
- **Aerial physical interaction with a movable object** — *German Aerospace Center* (*DLR*), *Germany*, *Jul 2024*
  Flying robots group, institute of robotics and mechatronics
- **Aerial physical interaction with a possibly movable object** — *KTH Royal Institute of Technology, Sweden*, *Dec 2023*
  Distributed hybrid systems group (Online)

Skills

Programming C/C++, Matlab, Simulink, ROS, Python
Language Korean (native), English (proficient)
Tools Git, CAD(Solidworks, Onshape), Optimization Toolbox/Solver(Acados, CasADi, CPLEX)

Reference

- Prof. H. Jin Kim, Seoul National University, hjinkim@snu.ac.kr
- Prof. Dimos V. Dimarogonas, KTH Royal Institute of Technology, dimos@kth.se
- Prof. Seung Jae Lee, Seoul National University of Science and Technology, seungjae_lee@seoultech.ac.kr