Dongjae Lee

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Education

Seoul National University — *Seoul, South Korea*

Ph.D. candidate in Aerospace Engineering — *Sep 2020 – Feb 2025 (expected)*

- Advisor: Prof. H. Jin Kim
- Research focus: aerial manipulation, robust/adaptive control, new platform design
- 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

Visiting PhD student — *Stockholm, Sweden*

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

- Advisor: Prof. Dimos Dimarogonas
- Research focus: collaborative manipulation, event-triggered control

Online Education Mentor — *Seoul, South Korea*

Engineering Mathematics — *Dec 2017 – Jun 2018*

HOLIX (former: Educast)

Projects

Tiltrotor design and collaborative transportation — *South Korea*

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

- platform design, control & experiments, **led the team of graduate students**

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

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

- optimization-based motion planning & 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 & outdoor experiment

Honors

Awards

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

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

Publications

* indicates equal contributions

Journal Articles

[J1] 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)** 9.8 (2024) pp. 6999–7006. 2024.

[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] Autonomous Excavator for Precise Earthcutting 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] 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)** 9.5 (2024) pp. 4854–4861. IEEE, 2024.

[J5] 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)** 8.9 (2023) pp. 5807–5814. IEEE, 2023.

[J6] 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). IEEE, 2023.

[J7] RISE-based trajectory tracking control of an aerial manipulator under uncertainty
D. Lee, J. Byun, H. J. Kim
IEEE Control Systems Letters **(LCSS)** 6 (2022) pp. 3379–3384. IEEE, 2022.

[J8] 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)** 6.2 (2021) pp. 723–730. IEEE, 2021.

[J9] 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)** 26.2 (2021) pp. 765–776. IEEE, 2021.

Conference Proceedings

[C1] 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.

[C2] 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.

[C3] 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.

[C4] 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.

[C5] 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.

[C6] 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.

[C7] 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.

[C8] 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.

[C9] 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.

[C10] 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.

[C11] 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] Autonomous Aerial Manipulation at Arbitrary Pose in SE(3) with Robust Control and Whole-body Planning
D. Lee*, B. Kim*, H. J. Kim
under review (journal submission).

[M3] Switching Law and Control for a class of Nonlinear Input-Affine Multi-Channel Systems with Partial Controllability
D. Lee, D. V. Dimarogonas, H. J. Kim
in preparation.

[M4] Safety-Critical Control for Aerial Physical Interaction in Uncertain Environment
J. Byun, Y. Kim, **D. Lee**, H. J. Kim
under review (conference submission).

Invited Presentations

- **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)

Academic Services

- Journal reviewer for IEEE RAL — *2021–2024*
- Journal reviewer for IEEE/ASME TMECH — *2021, 2023*
- Journal reviewer for IEEE TASE — *2021, 2023–2024*
- Journal reviewer for IEEE TAC — *2024*
- Journal reviewer for IEEE LCSS — *2022*
- Journal reviewer for IEEE ACCESS — *2020*
- Journal reviewer for Springer IJCAS — *2019, 2021-2024*
- Conference reviewer for IEEE ICRA — *2020–2023*
- Conference reviewer for IEEE IROS — *2023*

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