

Dongjae Lee

1, Gwanak-ro, Gwanak-gu, Seoul 08826, Republic of Korea

✉ ehdwo713@snu.ac.kr | 🏠 dongjaelee95.github.io | 📄 github.com/DongjaeLee95 | 🌐 linkedin.com/in/dongjae-lee-a25484224/ | 🎓 Dongjae Lee

Research Interests

Aerial Manipulation, Robot-Environment Interaction, Robust Control, Model Predictive Control, Motion Planning

Education

Seoul National University

Ph.D. candidate in Aerospace Engineering

- Advisor: Prof. H. Jin Kim
- Research Focus: aerial manipulation for robot-environment interaction

Seoul, South Korea

Sep 2020 – present

Seoul National University

M.S. in Mechanical and Aerospace Engineering

- Advisor: Prof. H. Jin Kim
- Thesis: Opening a Hinged Door with an Aerial Manipulator using Model Predictive Control

Seoul, South Korea

Sep 2018 – Aug 2020

Seoul National University

B.S. in Mechanical and Aerospace Engineering

Seoul, South Korea

Mar 2014 – Feb 2018

Experiences

Visiting PhD student

KTH Royal Institute of Technology

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

Stockholm, Sweden

Apr 2024 – present

Online Education Mentor

Engineering Mathematics

HOLIX (former: Educast)

Seoul, South Korea

Dec 2017 – Jun 2018

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

Projects

Tiltrotor design and collaborative transportation

Ministry of Education (MoE)

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

South Korea

Jun 2022 – May 2023

Landscape inspection and motion planning for automating industrial excavator

Hyundai Construction Equipment (HCE)

- optimization-based motion planning & outdoor experiment

South Korea

Feb 2020 – Dec 2022

Precise aerial manipulation with autonomous drones

Ministry of Trade, Industry and Energy (MoTIE)

- outdoor experiment of cooperative aerial transportation

South Korea

Feb 2020 – May 2020

- pick-and-place mechanism design & outdoor experiment

Skills

Programming C/C++, Matlab, Simulink, ROS, Python

Language Korean (native), English (proficient)

Tools Vim, Git, Solidworks, Onshape

Publications

JOURNAL ARTICLES

- [J1] Image-Based Time-Varying Contact Force Control of Aerial Manipulator using Robust Impedance Filter
Jeonghyun Byun, Junha Kim, Dohyun Eom, **Dongjae Lee**, Changhyeon Kim, H. Jin Kim
IEEE Robotics and Automation Letters (RAL) accepted.
- [J2] Design, Modeling and Control of a Top-loading Fully-Actuated Cargo Transportation Multirotor
Wooyong Park, Xiangyu Wu, **Dongjae Lee**, Seung Jae Lee
IEEE Robotics and Automation Letters (RAL) 8.9 (2023) pp. 5807–5814. IEEE, 2023.
- [J3] A Hybrid Controller Enhancing Transient Performance for an Aerial Manipulator Extracting a Wedged Object
Jeonghyun Byun, Inkyu Jang, **Dongjae Lee**, H. Jin Kim
IEEE Transactions on Automation Science and Engineering (TASE) (2023). IEEE, 2023.
- [J4] RISE-based trajectory tracking control of an aerial manipulator under uncertainty
Dongjae Lee, Jeonghyun Byun, H. Jin Kim
IEEE Control Systems Letters (LCSS) 6 (2022) pp. 3379–3384. IEEE, 2022.
- [J5] Aerial manipulator pushing a movable structure using a DOB-based robust controller
[2021 ICRA Best Paper Award on Unmanned Aerial Vehicles]
Dongjae Lee, Hoseong Seo, Inkyu Jang, Seung Jae Lee, H. Jin Kim
IEEE Robotics and Automation Letters (RAL) 6.2 (2021) pp. 723–730. IEEE, 2021.
- [J6] Fully actuated autonomous flight of thruster-tilting multirotor
Seung Jae Lee, **Dongjae Lee**, Junha Kim, Dabin Kim, Inkyu Jang, H. Jin Kim
IEEE/ASME Transactions on Mechatronics (TMECH) 26.2 (2021) pp. 765–776. IEEE, 2021.

CONFERENCE PROCEEDINGS

* indicates equal contributions

- [C1] Autonomous aerial perching and unperching using omnidirectional tiltrotor and switching controller
Dongjae Lee, Sunwoo Hwang, Jeonghyun Byun, Seung Jae Lee, H. Jin Kim
2024 International Conference on Robotics and Automation (ICRA) accepted.
- [C2] Safety-Critical Control under Multiple State and Input Constraints and Application to Fixed-Wing UAV
Donggeon David Oh*, **Dongjae Lee***, H. Jin Kim
2023 IEEE Conference on Decision and Control (CDC), 2023.
- [C3] Minimally actuated tiltrotor for perching and normal force exertion
Dongjae Lee, Sunwoo Hwang, Changhyeon Kim, Seung Jae Lee, H. Jin Kim
2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2023.
- [C4] Globally Defined Dynamic Modelling and Geometric Tracking Controller Design for Aerial Manipulator
Byeongjun Kim, **Dongjae Lee**, Jeonghyun Byun, H. Jin Kim
2023 IEEE International Conference on Robotics and Automation (ICRA), 2023.
- [C5] Stability and robustness analysis of plug-pulling using an aerial manipulator
Jeonghyun Byun, **Dongjae Lee**, Hoseong Seo, Inkyu Jang, Jeongjun Choi, H. Jin Kim
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.
- [C6] Real-time motion planning of a hydraulic excavator using trajectory optimization and model predictive control
Dongjae Lee*, Inkyu Jang*, Jeonghyun Byun, Hoseong Seo, H. Jin Kim
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.
- [C7] Robust and Recursively Feasible Real-Time Trajectory Planning in Unknown Environments
Inkyu Jang, **Dongjae Lee**, Seungjae Lee, H. Jin Kim
2021 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2021.
- [C8] Aerial manipulation using model predictive control for opening a hinged door
Dongjae Lee, Hoseong Seo, Dabin Kim, H. Jin Kim
2020 IEEE International Conference on Robotics and Automation (ICRA), 2020.
- [C9] Trajectory planning with safety guaranty for a multirotor based on the forward and backward reachability analysis
Hoseong Seo, Clark Youngdong Son, **Dongjae Lee**, H. Jin Kim
2020 IEEE International Conference on Robotics and Automation (ICRA), 2020.

- [C10] Cargo transportation strategy using T 3-Multirotor UAV
Seung Jae Lee, **Dongjae Lee**, H Jin Kim
2019 International Conference on Robotics and Automation (ICRA), 2019.

MANUSCRIPTS UNDER REVIEW / IN PREPARATION

* indicates equal contributions

- [M1] Autonomous Heavy Object Pushing Using a Coaxial Tiltrotor
Sunwoo Hwang*, **Dongjae Lee***, Changhyeon Kim, H. Jin Kim
submitted to IEEE Transactions on Automation Science and Engineering (TASE).
- [M2] Autonomous Excavator for Precise Earthcutting and Onboard Landscape Inspection
Inkyu Jang*, Junha Kim*, **Dongjae Lee***, Changhyeon Kim*, Changsuk Oh, Youngbum Kim, Sangwook Woo, Heejee Sung, H. Jin Kim
submitted to IEEE Robotics & Automation Magazine (RAM).
- [M3] Aerial physical interaction with robust stability guarantee against sudden collision and contact-loss
Dongjae Lee, Jeonghyun Byun, H. Jin Kim
submitted to IEEE Transactions on Robotics (TRO).
- [M4] Saturated RISE control for considering rotor thrust saturation of fully actuated multirotor
Dongjae Lee, H. Jin Kim
submitted to 2024 International Conference on Unmanned Aircraft Systems (ICUAS).
- [M5] Robust Omnidirectional Aerial Manipulation with Enlarged Workspace
Dongjae Lee*, Byeongjun Kim*, H. Jin Kim
in preparation.

Academic Services

- Journal reviewer for IEEE RAL 2021–2023
- 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, 2021–2023
- Conference reviewer for IEEE ICRA 2020–2023
- Conference reviewer for IEEE IROS 2023

Reference

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