Dongjae Lee

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

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

Research Interests

Aerial Manipulation, Robot-Environment Interaction, Robust Control, Model Predictive Control, Safety-Critical Control

Education

Seoul National University   *Seoul, South Korea*

Ph.D. Student in Aerospace Engineering   *Sep 2020 – present*

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

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

Seoul National University   *Seoul, South Korea*

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

Publications

JOURNAL ARTICLES

[J1]   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)** (2023). 2023.

[J2]   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.

[J3]   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.

[J4]   Aerial manipulator pushing a movable structure using a DOB-based robust controller
[2021 ICRA Best Paper Award on Unmannaed 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.

[J5]   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]   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.

[C2]   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.

[C3]   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.

[C4]   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.

[C5]   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.

[C6]   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.

[C7] 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.

[C8] 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.

[C9] 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

[M2] Aerial physical interaction with robust stability guarantee against sudden collision and contact-loss
Dongjae Lee, Jeonghyun Byun, H. Jin Kim

[M3] Autonomous Excavator System for Precise Earthcutting and Onboard Landscape Inspection
Inkyu Jang*, Junha Kim*, **Dongjae Lee***, Changhyeon Kim*, Changsuk Oh, H. Jin Kim

Honors

Awards

2022	BK21 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*
2018	The Best Presentation Award from Bachelor Thesis	*Seoul National University, South Korea*

Fellowship

2022–2023	Ph.D. Fellowship from National Research Foundation (NRF) of Korea	*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   *South Korea*
Ministry of Education (MoE)   *Jun 2022 – May 2023*
• platform design, control & experiments, Role: **project leader**

Landscape inspection and motion planning for automating industrial excavator   *South Korea*
LARR-Hyundai Construction Equipment (HCE)   *Feb 2020 – Dec 2022*
• optimization-based motion planning & outdoor experiment, Role: student researcher

Precise aerial manipulation with autonomous drones   *South Korea*
LARR-Ministry of Trade, Industry and Energy (MoTIE)   *Feb 2020 – May 2020*
• outdoor experiment of cooperative aerial transportation, Role: student researcher

Development of specialized multirotor for transportation   *South Korea*
LARR-Ministry of Trade, Industry and Energy (MoTIE)   *Jan 2019 – Dec 2019*
• pick-and-place mechanism design & outdoor experiment, Role: student researcher

Experiences

Teaching assistant   *Seoul National University, South Korea*
Introductory Engineering Probability   *Sep 2018 – Dec 2018*

Research Internship   *Seoul National University, South Korea*
Lab for Autonomous Robotics Research (LARR), Advisor: H. Jin Kim   *Apr 2018 – Aug 2018*

Online Education Mentor   *Educast, South Korea*
Engineering Mathematics   *Dec 2017 – Jun 2018*

Skills

Programming	C/C++, Matlab, Simulink, ROS, Python
Language	Korean (native), English (proficient)
Tools	Vim, Git, Solidworks, Onshape

Reference

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