

Education

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| <ul style="list-style-type: none">• The University of Tokyo
• <i>Ph. D. Student in Mechanical Engineering</i>• Beihang University
• <i>M. Sc. in Control Science and Engineering, GPA: 89.8/100 (Top 10%)</i>• Beihang University
• <i>B. Eng. in Automation, ShenYuan Honors College, GPA: 89.7/100 (Top 10%)</i> | <p>Oct. 2023 – Sept. 2026 (Expected)
<i>Advisor: Lecturer Moju ZHAO</i></p> <p>Sept. 2020 – June 2023
<i>Advisor: Prof. Zhang REN</i></p> <p>Sept. 2016 – June 2020
<i>Supervisor: Prof. Lei GUO</i></p> |
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Research Interests

My research interest lies in optimization-based control with applications in aerial manipulation, aiming to make aerial robots function as flying hands rather than just eyes.

Publications

Papers

1. [Submitted to T-RO] Jinjie Li, Johannes Kübel, Yicheng Chen, Haokun Liu, Moju Zhao, “Effector-Centric NMPC of Tiltable Multirotors for Offset-Free Omnidirectional Aerial Manipulation”, *IEEE Transactions on Robotics*, 2025.
2. [IROS’25] Jinjie Li^{†*}, Jiaxuan Li[†], Kotaro Kaneko, Haokun Liu, Liming Shu, Moju Zhao, “Six-DoF Hand-Based Teleoperation for Omnidirectional Aerial Robots”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hangzhou, China, 2025. [[pdf](#)] [[video](#)]
3. [RA-L’24] Jinjie Li, Junichiro Sugihara, Moju Zhao*, “Servo Integrated Nonlinear Model Predictive Control for Overactuated Tiltable-Quadrotors”, *IEEE Robotics and Automation Letters (RA-L)*, vol. 9, no. 10, pp. 8770-8777, Oct. 2024, doi: 10.1109/LRA.2024.3451391. [[pdf](#)] [[video](#)]
4. [CDC’23] Jinjie Li, Liang Han*, Haoyang Yu, Yuheng Lin, Qingdong Li, Zhang Ren, “Nonlinear MPC for Quadrotors in Close-Proximity Flight with Neural Network Downwash Prediction”, *IEEE Conference on Decision and Control (CDC)*, Singapore, Singapore, 2023, pp. 2122-2128, doi: 10.1109/CDC49753.2023.10383632. [[pdf](#)] [[code](#)]
5. [ICRA’23 Workshop] Jinjie Li*, Liang Han, Haoyang Yu, Yuheng Lin, Qingdong Li, Zhang Ren, “Potato: A Data-Oriented Programming 3D Simulator for Large-Scale Heterogeneous Swarm Robotics”, *ICRA’23 Workshop on The Role of Robotics Simulators for Unmanned Aerial Vehicles*, 2023. [[pdf](#)] [[code](#)]
6. [ICRA’22] Jinjie Li, Liang Han*, Zhang Ren, “Indoor Localization for Quadrotors using Invisible Projected Tags”, *IEEE International Conference on Robotics and Automation (ICRA)*, Philadelphia, PA, USA, 2022, pp. 9404-9410, doi: 10.1109/ICRA46639.2022.9812449. [[oral](#)] [[pdf](#)] [[video](#)]

Co-Authored

7. [AIS’25] Haokun Liu, Zhaoqi Ma, Yunong Li, Junichiro Sugihara, Yicheng Chen, Jinjie Li, Moju Zhao, “Hierarchical Language Models for Semantic Navigation and Manipulation in an Aerial-Ground Robotic System”, *Advanced Intelligent Systems*, Oct. 2025, doi: 10.1002/aisy.202500640. [[pdf](#)] [[video](#)]
8. [IROS’25] Yicheng Chen, Jinjie Li, Wenyuan Qin, Yongzhao Hua, Qingdong Li, “Learning to Initialize Trajectory Optimization for Vision-Based Autonomous Flight in Unknown Environments”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, Hangzhou, China, 2025. [[pdf](#)] [[video](#)] [[code](#)]
9. [ICRA’25] Hisaaki Iida, Junichiro Sugihara, Kazuki Sugihara, Haruki Kozuka, Jinjie Li, Keisuke Nagato, Moju Zhao*, “Adaptive Perching and Grasping by Aerial Robot with Light-weight and High Grip-force Tendon-driven Three-fingered Hand using Single Actuator”, *IEEE International Conference on Robotics and Automation (ICRA)*, Atlanta, USA, 2025. [[pdf](#)] [[video](#)]
10. [ICRA’23] Ziwei Yan, Liang Han*, Xiaoduo Li, Jinjie Li, Zhang Ren, “Event-Triggered Optimal Formation Tracking Control Using Reinforcement Learning for Large-Scale UAV Systems”, *IEEE International Conference on Robotics and Automation (ICRA)*, London, United Kingdom, 2023, pp. 3233-3239, doi: 10.1109/ICRA48891.2023.10160532. [[pdf](#)] [[video](#)]

Others

1. Liang Han, Jinjie Li, Zhang Ren, “An Indoor Localization Method based on Invisible Projected Tags”, *Chinese Invention Patent*, 202111154577.4.
2. “A Localization Software based on Invisible Projected Fiducial Tags”, *Chinese Software Copyright*, 2022SR0123403.
3. “A Large-Scale Heterogeneous Multi-Agent Simulation Platform V1.0”, *Chinese Software Copyright*, 2021SR1039534.

Projects w/o Pub.

Academic Projects, Beihang University

Beijing, China

• Dyna-Q based Formation Control for Quadrotors with AprilTag Localization

Dec. 2019 – June 2020

Bachelor's Thesis

Advisor: Prof. Liang Han

- Visual positioning with fiducial tags, formation control with Dyna-Q reinforcement learning, and verified on a ROS/Gazebo simulation platform; achieving sub-3 cm formation error. [\[thesis\]](#) [\[code\]](#)
- The thesis was ranked **No.1** in my major.

• Development of a Water Container with a Settable Temperature Controller

Feb. 2018 – June 2018

Team Leader, Course Project of Fundamentals of Analog Electronics

Advisor: Prof. Yao Tang

- Developed a temperature-control system for a water heater from scratch, capable of maintaining any set temperature between 50 °C and 100 °C. The 220 V-powered hardware, paired with a Bluetooth interface, could achieve the target temperature in under five minutes. [\[video\]](#)
- Responsibilities included **circuit design, PCB layout, PID tuning, and full system integration**. [\[blog\]](#)
- Ranked No.1 in my class. Invited by [Lunar Palace 1 Lab](#) to design a temperature control system for plant cultivation.

Beihang Aeromodelling Team, Beihang University

Beijing, China

• Development of Heavy Load and High Maneuverability Aircrafts

Nov. 2016 – Oct. 2018

Leader of the Composite Material Team & Pilot

Supervisor: Prof. Zhiqiang Wan

- Designed and produced the composite part of a 5 m-wingspan aircraft with a maximum load of 24 kg, maximum take-off weight of 27.5 kg, and nominal airspeed of 15 m/s. Applied a carbon-PMI-carbon sandwich structure to build a 130 g single wing spar; used carbon & glass fiber reinforced polymer (CGFRP) for the D-box, raising torsional rigidity by 261 %. [\[blog\]](#)
- Piloted solar-powered aircraft prototypes. [\[blog\]](#)
- Won the championship in the 2018 China Aeromodelling Design Challenge (CADC, Time-limited Airdrop Project), the best record in history. Reported by [BMFA \(British Model Flying Association\) News](#) magazine. [\[news\]](#)

Skills Summary

- **Languages:** English (TOEFL iBT 100), Japanese (Beginner), Chinese (Mother Tongue)
- **Coding:** AI Prompt, GitHub Action, Git, Python, C/C++, MATLAB, Mathematica, L^AT_EX, Data-Oriented Programming
- **Software:** ROS 1&2, acados, CasADi, Pinocchio, KDL, Gazebo, PX4, PyTorch, OpenCV, Pandas, Docker, Eigen
- **Hardware:** NVIDIA Jetson, Raspberry Pi, STM32, Pixhawk, Circuit Design (Altium Designer), CAD (SolidWorks), CNC
- **Hobbies:** Model Airplane (pilot for fixed-wing drones and quadrotors), Photography [\[homepage\]](#), Tennis, Table Tennis, Ski

Leadership

As the first Ph.D. student in our lab, I play a key role in shaping a collaborative and productive research environment. I have successfully collaborated with researchers from China, Japan, Germany, and Italy, demonstrating strong international teamwork skills.

Honors and Awards

- **Best Paper Award Candidate** on the workshop of *Advancements in Aerial Physical Interaction*, IROS 2025
- ICRA 2025 RAS Travel Support 2025
- PhD Scholarship from Chinese Scholarship Council (CSC) 2023
- The Champion of “Simulated Search and Rescue Project” in China Aeromodelling Design Challenge (CADC) 2017

Academic Services

Serve as reviewers for RA-L, ICRA'25, IROS'25, ICRA'24, IROS'24, and CDC'23. IEEE RAS Graduate Student Member.