Jinjie LI

Email: jinjie-li@dragon.t.u-tokyo.ac.jp
Homepage: jinjie.li

Education

- **The University of Tokyo** — Oct. 2023 – Sept. 2026 (Expected)
  Ph. D. Student in Mechanical Engineering — *Advisor: Lecturer Moju ZHAO*
- **Beihang University** — Sept. 2020 – June 2023
  M. Sc. in Control Science and Engineering, GPA: 89.8/100 (Top 10%) — *Advisor: Prof. Zhang REN*
- **Beihang University** — Sept. 2016 – June 2020
  B. Eng. in Automation, ShenYuan Honors College, GPA: 89.7/100 (Top 10%) — *Supervisor: Prof. Lei GUO*

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]

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, LaTeX, 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.