

Li, Jinjie

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Education

- **The University of Tokyo** Oct. 2023 – Sept. 2026 (Expected)
Ph. D. student in Mechanical Engineering Tokyo, Japan
 - Throughout my PhD journey, I am working to establish a Model Predictive Control (MPC)-based theoretical framework for controlling overactuated systems.
 - Specifically, we aim to formulate the control problem as an optimization problem, create a solver that can solve it effectively and efficiently, and evaluate optimality and convergence from a mathematical perspective. One latest finding is that integrating a first-order model can accelerate the convergence of the MPC algorithm.
 - All the code has been open-sourced at https://github.com/Li-Jinjie/jsk_aerial_robot_dev/releases/tag/RA-L24.
- **Beihang University** Sept. 2020 – June 2023
M. Sc. in Control Science and Engineering Beijing, China
 - Design an MPC-based algorithm that explores the integration of disturbance identification with Model Predictive Control. Provide a theoretical analysis of the algorithm.
 - Specifically, disturbances are identified using a multilayer perceptron with spectral normalization. This identified model is then integrated into the Model Predictive Control pipeline in the form of force.
 - All the code has been open-sourced at https://github.com/Li-Jinjie/ndp_nmmpc.qd.
- **Beihang University** Sept. 2016 – June 2020
B. Eng. in Automation Beijing, China
- **Taiyuan No.5 High School** Sept. 2013 – June 2016
High School Student Taiyuan, Shanxi, China

Employment History

- I have no work experience.

Memberships

- IEEE Graduate Student Member

Publications

1. **[RA-L'24]** J. Li, J. Sugihara and M. Zhao, "Servo Integrated Nonlinear Model Predictive Control for Overactuated Tilttable-Quadrotors", *IEEE Robotics and Automation Letters (RA-L)*, vol. 9, no. 10, pp. 8770-8777, Oct. 2024.
Proposed an NMPC framework for overactuated systems, highlighting the importance of a first-order actuator model.
2. **[CDC'23]** J. Li, L. Han, H. Yu, Y. Lin, Q. Li and Z. Ren, "Nonlinear MPC for Quadrotors in Close-Proximity Flight with Neural Network Downwash Prediction", *2023 62nd IEEE Conference on Decision and Control (CDC)*, Singapore, Singapore, 2023, pp. 2122-2128.
Propose a novel framework that integrates MLP-based identification method with a Nonlinear MPC controller.
3. **[ICRA'22]** J. Li, L. Han and Z. Ren, "Indoor Localization for Quadrotors using Invisible Projected Tags", *2022 IEEE International Conference on Robotics and Automation (ICRA)*, Philadelphia, PA, USA, 2022, pp. 9404-9410.
Propose an indoor localization method for VR scenarios using a projector, which is very useful in the field of education.

Conferences

- **Poster Presentation (2024)**
Presented a poster about our work "Nonlinear MPC Pose Control for an Overactuated Tilting-Quadrotor" at Robotics and Mechatronics Conference (ROBOMECH) 2024, Utsunomiya, Japan.
- **Paper Presentation (2023)**
Presented our CDC paper "Nonlinear MPC for Quadrotors in Close-Proximity Flight with Neural Network Downwash Prediction" at 2023 62nd IEEE Conference on Decision and Control (CDC), Singapore, Singapore.
- **Paper Presentation (2022)**
Virtually presented (due to COVID-19) our ICRA paper "Indoor Localization for Quadrotors using Invisible Projected Tags" at 2022 IEEE International Conference on Robotics and Automation (ICRA), Philadelphia, PA, USA.