

CURRICULUM VITAE: TIAN-ZHI LI

BASIC INFORMATION

Tian-Zhi Li

Email: tlee@stu.pku.edu.cn

Address: 21 Nanyang Link, 637371 Singapore

Homepage: tianzhi-li.github.io



Tian-Zhi is a final-year PhD student at School of Advanced Manufacturing and Robotics, Peking University. Also, he is currently a visiting PhD student (Dec-2024 - Dec-2025) at Nanyang Technological University (NTU), Singapore. Prior to that, he received his B.Sc. in Mathematics from Beijing Institute of Technology (BIT) in 2021.

His research interest lies in the field of **Dynamics** and **Control** of mechanical systems. He is especially interested in leveraging **differential geometry** and **physical principles** to develop computationally efficient algorithms for dynamics, control, estimation, and learning with sound theoretical guarantees. Specifically, they include:

- (a) **Geometric Mechanics & Control** (especially stochastic & nonholonomic)
- (b) **Structure-Preserving Algorithms** (variational integrators)
- (c) **Geometric Estimation & Filtering** (for robotic and flexible systems)
- (d) **Physics-Informed Learning on Manifolds** (e.g., rigid-body dynamics of robots)

EDUCATION

Peking University, Beijing

Sep 2021 - Jun 2026

Ph.D. Student (Mechanical Systems and Control)

Nanyang Technological University, Singapore

Dec 2024 - Dec 2025

Visiting Ph.D. Student (Geometric Mechanics and Control)

Beijing Institute of Technology, Beijing

Sep 2017 - Jun 2021

Bachelor of Science (Mathematics)

SELECTED PUBLICATIONS

Journal Papers

- [J1] Tianzhi Li and Jinzhi Wang, Variational Unscented Kalman Filter on Matrix Lie Groups, **Automatica**, 172: 111995, 2025 (Regular Paper). [\[Paper Link\]](#)
- [J2] Tianzhi Li and Jinzhi Wang, Physics-Informed Gaussian Process Learning on Lie Groups, **Journal of Guidance, Control, and Dynamics**, 48 (11), pp. 2654-2662, 2025. [\[Paper Link\]](#)
- [J3] Tianzhi Li, Rui Fu, and Jinzhi Wang, Reduced Dynamics and Geometric Optimal Control of Nonequilibrium Thermodynamics: Gaussian Case, **Automatica**, 164: 111626, 2024 (Regular Paper). [\[Paper Link\]](#)
- [J4] Tianzhi Li, Jinzhi Wang, and Zhisheng Duan, Structure-Preserving Unscented Kalman Filter for Planar Mobile Robots, **IEEE Control Systems Letters**, vol. 9, pp. 2157-2162, 2025. [\[Paper Link\]](#)

Conference Papers

- [C1] Tianzhi Li, François Gay-Balmaz, Donghua Shi, and Jinzhi Wang, Variational Principle for Stochastic Nonholonomic Systems **Part II**: Stochastic Nonholonomic Integrator. In : Nielsen, F., Barbaresco, F. (eds) Geometric Science of Information (**GSI'25**), Saint-Malo, France, vol. 16034, pp. 225-233. Springer Cham, 2026.
- [C2] Tianzhi Li, François Gay-Balmaz, Donghua Shi, and Jinzhi Wang, Variational Principle for Stochastic Nonholonomic Systems **Part I**: Continuous-Time Formulation. In : Nielsen, F., Barbaresco, F. (eds) Geometric Science of Information (**GSI'25**), Saint-Malo, France, vol. 16034, pp. 204-213. Springer Cham, 2026.
- [C3] Tianzhi Li and Jinzhi Wang, A Structure-Preserving Learning Scheme on SO(3), 2024 43rd IEEE Chinese Control Conference (**CCC'24**), Kunming, China, 2024, pp. 5149-5152.
- [C4] Tianzhi Li and Jinzhi Wang, Multisymplectic Unscented Kalman Filter for Geometrically Exact Beams. In : Nielsen, F., Barbaresco, F. (eds) International Conference on Geometric Science of Information (**GSI'23**). Lecture Notes in Computer Science, Saint-Malo, France, vol. 14072, pp. 60-68, Springer Verlag.

HONORS AND AWARDS

- National Scholarship (top 1%), by China Ministry of Education, Sep-2025
- Presidential Doctoral Scholarship, by Peking University, Jun-2025
- College of Engineering Dean's Scholarship - First Prize, by Peking University, Oct-2024
- Outstanding Teaching Assistant Award, by Peking University, Mar-2024/Apr-2023 (twice)