

LONG XU | 徐隆

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EDUCATION

Zhejiang University (ZJU), Hangzhou, Zhejiang, China **2022 – Present**

Ph.D. student in Electronic Information, College of Control Science and Engineering.

- Advisor: Prof. [Fei Gao](#)

Zhejiang University (ZJU), Hangzhou, Zhejiang, China **2018 – 2022**

B.Eng. in Automation, College of Control Science and Engineering.

HONORS AND AWARDS

- **1st prize** at ICRA 2022 RoboMaster AI Challenge (rank **2nd**/35) 2022
- Zhejiang Government Scholarship (top **3%**) 2020
- First Academic Scholarship of Zhejiang University (top **3%**) 2019

EXPERIENCES & PROJECTS

ZJU-FAST Lab **05/2021 – 08/2023**

RoboMaster 2022 University AI Challenge (RMUA2022)

- Designed motion planning module. [[Vedio](#)]
- Realized **dynamic obstacle avoidance**, **dual-robot collaboration** and **rapid local re-planning**.
- Accelerate the process of trajectory optimization by using **CUDA** and GPU.

Research on motion planning of mobile robots on unstructured road (Graduation Project)

- Designed a geometry-based local **terrain assessment** algorithm.
- Using **B-spline** curve parameterized trajectories, implemented a local planner that considers **curvature constraint** and **terrain roughness**. [[Vedio](#)]

Design and manufacture of Ackermann chassis mobile robot (Research Assistant)

- Refitted the climbing remote control toy car into a **robot**. [[Vedio](#)]
- Implemented basis speed controller with STM32 and PID controller.
- Reproduced and implemented **Stanley trajectory tracking controller** with C++ and ROS.
- Reproduced and implemented the motion planning algorithm proposed in the work **"Driving on Point Clouds"**

RESEARCH PUBLICATIONS

([†]Equal Contribution)

- [1] **L. Xu[†]**, Z. Hou[†], F. Gao, "Learning Trajectory Generation on Uneven Terrain with Differentiable Trajectory Optimization and Manifold". On-going. To be submitted to RSS.
- [2] **L. Xu[†]**, C. Wong[†], F. Gao, "Primitive-based Truncated Diffusion for Efficient Trajectory Generation of Mobile Manipulators". Submitted to T-RO.
- [3] **L. Xu[†]**, C. Wong[†], M. Zhang, J. Lin, F. Gao, "Trajectory Optimization for Differential Drive Mobile Manipulators via Topological Paths Search and Arc Length-Yaw Parameterization". Under review. Submitted to ICRA 2026
[[Paper](#)][[Code](#)]

- [4] **L. Xu**, K. Chai, B. An, J. Gan, Q. Wang, Y. Zhou, X. Li, J. Lin, Z. Han, C. Xu, Y. Cao, F. Gao, “Tracailer: An Efficient Trajectory Planner for Tractor-Trailer Vehicles in Unstructured Environments”. *IEEE Transactions on Automation Science and Engineering*, 2025.
[Paper][Vedio][Code]
- [5] Z. Han[†], **L. Xu**[†], L. Pei, F. Gao, “Dynamically Feasible Trajectory Generation with Optimization-Embedded Networks for Autonomous Flight”, *IEEE Robotics and Automation Letters*, 2025.
[Paper][Web]
- [6] X. Li[†], **L. Xu**[†], X. Huang[†], D. Xue, Z. Zhang, Z. Han, C. Xu, Y. Cao, F. Gao, “SEB-Naver: A SE(2)-based Local Navigation Framework for Car-like Robots on Uneven Terrain”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2025.
[Paper][Vedio][Code]
- [7] Z. W, Y. Li, **L. Xu**, H. Shi, Z. Ma, Z. Chu, C. Li, F. Gao, K. Yang, K. Wang, “SF-TIM: A Simple Framework for Enhancing Quadrupedal Robot Jumping Agility by Combining Terrain Imagination and Measurement”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2025.
[Paper][Web]
- [8] S. Tan[†], Z. Hou[†], Z. Zhang[†], **L. Xu**, M. Zhang, Z. He, C. Xu, F. Gao, Y. Cao, “Real-time Spatial-temporal Traversability Assessment via Feature-based Sparse Gaussian Process”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2025.
[Paper][Code]
- [9] K. Chai[†], **L. Xu**[†], Q. Wang, C. Xu, P. Yin, F. Gao, “LF-3PM: a LiDAR-based Framework for Perception-aware Planning with Perturbation-induced Metric”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2024.
[Paper][Vedio][Code]
- [10] Z. Han[†], Y. Wu[†], T. Li, L. Zhang, L. Pei, **L. Xu**, C. Li, C. Ma, C. Xu, S. Shen, F. Gao, “An Efficient Spatial-Temporal Trajectory Planner for Autonomous Vehicles in Unstructured Environments”, *IEEE Transactions on Intelligent Transportation Systems*, 2023.
[Paper][Vedio][Code]
- [11] **L. Xu**, K. Chai, Z. Han, H. Liu, C. Xu, Y. Cao, F. Gao, “An Efficient Trajectory Planner for Car-like Robots on Uneven Terrain”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023.
[Paper][Vedio][Code]
- [12] C. Ma, Z. Han, T. Zhang, J. Wang, **L. Xu**, C. Li, C. Xu, F. Gao, “Decentralized Planning for Car-Like Robotic Swarm in Cluttered Environments”, *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2023.
[Paper][Vedio][Code]
- [13] J. Wang[†], **L. Xu**[†], H. Fu, Z. Meng, C. Xu, Y. Cao, X. Lyu, F. Gao, “Towards Efficient Trajectory Generation for Ground Robots beyond 2D Environment”, *IEEE International Conference on Robotics and Automation (ICRA)*, 2023.
[Paper][Vedio][Code]

SKILLS

- **Language:** Mandarin, native speaker; English, IELTS/7.0
- **Programming:** C++/C, Python, MATLAB, Java, CUDA
- **Software Development:** UE, ROS, Pytorch, IsaacGym, Docker
- **Hardware Development:** IoT chips (STM32, Arduino), SolidWorks

ADDITIONAL ACTIVITIES

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|---|------|
| • Minister of Youth Volunteer Department of Youth League Committee, ZJU | 2019 |
| • Chief sax of Marching Band of Zhejiang University | 2019 |