

# Ziyi Xu

 [calculatexzy.github.io](https://github.com/calculatexzy)

 Google Scholar

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## EDUCATION

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- **École Polytechnique Fédérale de Lausanne (EPFL)** Lausanne, Switzerland  
*Master in Robotics & Minor in Data Science* Sept 2025 - June 2027 (expected)
- **Zhejiang University** Hangzhou, China  
*Bachelor of Engineering - Robotics Engineering; GPA: 3.99/4.0 (91.8/100, rank:1/41)* Sept 2021 - June 2025  
*Courses: RoboticsI(Manipulation), RoboticsII(Navigation), Automatic Control, Optimization and Optimal Control, Machine Vision*

## PROJECT EXPERIENCE

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- **Idiap Research Institute - Advisor: Sylvain Calinon** Martigny, Switzerland  
*Research Intern* Oct 2025 -
  - **Ergodic Imitation for Adaptive Exploration around Demonstrations**  
Proposes to develop principled exploration strategies that leverage the geometry and statistics of demonstrations, together with online sensing, in order for the robot to adapt to the mismatch between training and deployment conditions in imitation learning, caused for example by environmental changes or imperfect sensing and control.
- **Robotics & Machine Intelligence Lab - Advisor: Qiuguo Zhu** Hangzhou, China  
*Research Intern* Dec 2024 - May 2025
  - **Reinforcement Learning for Ladder-Climbing Quadrupeds**  
Designed and integrated a custom hook-based foot mechanism to enhance stability during vertical traversal. Developed a reinforcement learning framework enabling quadruped robots (Lite3) to climb various ladder configurations.
- **CMU SafeAI Lab - Advisor: Ding Zhao** Pittsburgh, USA  
*Research Intern* Jul 2024 - Oct 2024
  - **Query-centric Diffusion Policy for Generalizable Robotic Assembly**  
Developed a two-stage hierarchical framework with a query-centric diffusion policy for zero-shot execution of long-horizon assembly tasks in robot manipulation, using task-relevant queries to guide the policy.  
Project page: [qdp-homepage/](https://qdp-homepage/)
- **FAST-LAB FAR - Advisor: Fei Gao** Huzhou, China  
*Research Intern* Jun 2023 - May 2024
  - **Bearing-based Localization & Mutual Observation in UAV Swarms**  
Trained and deployed a drone detection&tracking module in visual-based UAV-swarm systems jointly solving active mutual observation and anonymous initialization. Two co-authored papers accepted by IROS 2024 and RA-L.
  - **RoboMaster University AI Challenge(Classic) - National Champion**  
Teamed up and won an autonomous drone racing challenge with our self-built drone. Almost twice as fast as the runner-up. Contributed to robust goal detection and high level finite-state-machine design.
  - **LiDAR inertial visual odometry (LIVO) Mapping**  
Revised the traditional bundle adjustment (BA) in an incremental form used in point cloud mapping: Spatial Diffusion Bundle Adjustment (DBA). Demonstrated smaller computation complexity and higher confidence level. Coauthored paper submitted for T-ASE.  
Contributed to cross-modal Sim(3) registration for LiDAR + VGGT framework. Coauthored paper accepted by RA-L.
  - **Reinforcement Learning for UAV Trajectory Tracking**  
Course Project for *Innovation and Practice in Robotics*. Generated a high-quality trajectory library, trained trajectory tracking, and deployed in real-world.

## PUBLICATIONS

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- **Query as You Need: Query-centric Diffusion Policy for Generalizable Robotic Assembly**  
*Ziyi Xu\**, Haohong Lin\*, Shiqi Liu\*, and Ding Zhao
- **LiDAR-VGGT: Cross-Modal Coarse-to-Fine Fusion for Globally Consistent and Metric-Scale Dense Mapping**  
*Lijie Wang, Lianjie Guo, Ziyi Xu, Qianhao Wang, Fei Gao, Xieyuanli Chen*  
IEEE Robotics and Automation Letters (**RA-L**)
- **LEMON-Mapping: Loop-Enhanced Large-Scale Multi-Session Point Cloud Merging and Optimization for Globally Consistent Mapping**  
*Lijie Wang, Xiaoyi Zhong, Ziyi Xu, Kaixin Chai, Anke Zhao, Tianyu Zhao, Changjian Jiang, Qianhao Wang, Fei Gao*  
In Submission for IEEE Transaction on Automation Science and Engineering (**T-ASE**)
- **Preserving Relative Localization of FoV-Limited Drone Swarm via Active Mutual Observation**  
*Lianjie Guo\*, Zaitian Gongye\*, Ziyi Xu, Yingjian Wang, Xin Zhou, Jinni Zhou, and Fei Gao*  
2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (**IROS**)
- **FACT: Fast and Active Coordinate Initialization for Vision-based Drone Swarms**  
*Yuan Li\*, Anke Zhao\*, Yingjian Wang\*, Ziyi Xu, Xin Zhou, Jinni Zhou, Chao Xu, and Fei Gao*  
IEEE Robotics and Automation Letters (**RA-L**)

## HONORS AND AWARDS

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- DJI RoboMaster University AI Challenge(Classic) - National Champion *March, 2024*
- Huawei Elite Scholarship in College of Control Science and Engineering *2023*
- Zhejiang University Scholarship - First Prize (Top 3%) *2022*
- Government Scholarship of Zhejiang Province *2022*
- Zhejiang University Robotics Competition - First Prize *2022*

## SKILLS AND INTERESTS

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- **Skills**

*Languages:* C/C++, Python, MATLAB, Lua

*Tools of Production:* ChatGPT, Pytorch, OpenCV, Pybullet, Isaac-Gym, ROS, SolidWorks, STM32(CubeMX, HAL, FreeRTOS), SIMULINK, Arduino

- **Research Interests**

Motion Planning, Optimal Control, Real-world Robotics

- **Hobbies**

Jigsaw, Reading, Piano, Traveling and Cooking

## SOCIAL ACTIVITIES

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- **Zhejiang University Student Robot Association - President of Association** Hangzhou, China  
*Led an association of over 200 students passionate about robotics.*  
*Awarded the Zhejiang University Top 10 Students' Association Award (2022-2023).* *Oct 2021 - Jun 2023*
- **Zhejiang University Chu Kochen(CKC) Alumni Secretariat** Hangzhou, China  
*Organized college alumni events and managed alumni communications and publicity.* *Sept 2021 - Jun 2022*
- **GS<sup>2</sup>C (A culture and creative industry clothing brand) - Intern** Kunming, China  
*Co-designed clothes and blogs posted on Xiaohongshu with over 10k viewers.* *May 2025 - Aug 2025*