Ziyi Xu

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EDUCATION

- **École Polytechnique Fédérale de Lausanne (EPFL)** — Lausanne, Switzerland
  Master in Robotics — *Sept 2025 - Feb 2028 (expected)*
- **Zhejiang University** — Hangzhou, China
  Bachelor of Engineering - Robotics Engineering; GPA: 3.99/4.0 (91.8/100) — *Sept 2021 - June 2025*
  Courses: *RoboticsI(Manipulation), RoboticsII(Navigation), Automatic Control, Optimization and Optimal Control, Machine Vision*

PROJECT EXPERIENCE

- **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.
- **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.
  - **Spatial BA for Large-scale Multi-session Point Cloud 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-RO.
  - **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.
- **National Student Research Training Program - Advisor: Yu Zhang** — Hangzhou, China
  Project Leader — *Mar 2023 - Mar 2024*
  - **Real-time 3D Point Cloud Object Detection Model Based on Auto-wheeled Robot Platform**
    Self-designed and built an autonomous car, compared SoTA point-cloud-based 3D object detection algorithms on board.
- **Robot Transportation & Confrontation Contest** — Hangzhou, China
  Project Leader — *Dec 2021 - Jun 2022*
  - **Zhejiang University Robotics Competition(Runner-up) & Robot Competition in Zhejiang Province**

PUBLICATIONS

- **Query as You Need: Query-centric Diffusion Policy for Generalizable Robotic Assembly**
  Ziyi Xu*, *Haohong Lin*, Shiqi Liu*, and Ding Zhao*

- **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 Robotics (**T-RO**)

- **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

- 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

- **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

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^{2}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