

XILIN ZHU

ROBOTICS, AUTONOMOUS SYSTEMS AND AI



CONTACT

+49 015566031848

zachariahzu25@outlook.com

Rüppurrer Str. 21, 76137
Karlsruhe, Germany

SKILLS

- Python, C, MATLAB
- PyTorch, OpenCV, YOLO
- ROS 2, VDA5050, MQTT
- A*, Dijkstra, FSM, PID
- VLA, LLM, VLM
- FastAPI, JSON, SSE
- SolidWorks, CAD
- Git, Docker

LANGUAGES

- Chinese (Native)
- Cantonese (Native)
- English (Proficient, IELTS 7.0)
- German (Intermediate, TestDaF TDN3)

ADDITIONAL INFORMATION

Portfolio: zacharyz.page

LinkedIn: xilin-zhu-zachary

GitHub: ZacharyZ-25



PROFILE

M.Sc. candidate in Mechatronics and Information Technology at Karlsruhe Institute of Technology (KIT), specializing in autonomous systems and AI. Hands-on experience in ROS 2 autonomous driving, robot fleet management, computer vision, VLA research, and AI application development. Builds systems from algorithm implementation and simulation through deployment on real robotic platforms.



EXPERIENCE & PROJECTS

Hand-State-Conditioned VLA for Timing-Aware HRI 09/2026 - 02/2027

Master's thesis, FZI Research Center for Information Technology. Designing a VLA state-token pathway from 3D hand position and velocity; comparing state-token, pixel-overlay, auxiliary-supervision, and no-hand baselines on collaborative-handover timing metrics.

Personal AI Digital Twin 07/2026 - Present

Independent full-stack project. Built FastAPI Profile, JSON Chat, and SSE APIs with an embeddable Web Component; added multilingual sessions, rate limiting, cancellation, XSS protection, and 72 passing backend tests.

Autonomous Driving System 04/2026 - 07/2026

KIT KAL project. Built a miniature ROS 2 autonomous-driving stack integrating OpenCV/YOLO perception, FSM decision-making, and PID closed-loop trajectory tracking.

VDA5050 Multi-Robot Fleet Management 04/2026 - 06/2026

KIT project. Implemented MQTT/JSON task dispatch, state synchronization, fleet monitoring, A*/Dijkstra planning, and conflict avoidance; migrated the system from simulation to a real industrial robot platform and verified stable operation on site.

Machine Learning and Computer Vision 04/2025 - 07/2025

KIT project. Implemented a PyTorch GAN for MNIST generation, core Vision Transformer components, and pretrained ViT image inference.

Conveying Line and AGV Engineering Internship 05/2023 - 08/2023

Guangdong HongLian Technology Co., Ltd. Supported technical communication, engineering drawings, conveying-line structural design, and AGV-related design for a logistics tray conveying system.

Gesture-Based Intelligent Mobile Robot Control 09/2022 - 04/2023

B.Sc. thesis, Guangzhou University. Optimized YOLOv5 and 3D-CNN models for static and dynamic gesture recognition, reaching 81.3% mAP and over 80% accuracy; converted recognized gestures into robot control commands.



EDUCATION

M.Sc. Mechatronics and Information Technology 04/2025 - 06/2027

Karlsruhe Institute of Technology (KIT), Germany

M.Sc. Studies in Autonomy Technologies 04/2024 - 04/2025

Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU)

B.Sc. Robot Engineering 09/2019 - 06/2023

Guangzhou University, China