Shili Zhang

Autonomous Systems and Robotics Engineer

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Profile

Graduate student in **Autonomous Systems and Robotics** with end-to-end experience across mechanical design, embedded software, and computer vision. Comfortable moving from simulation to on-robot deployment (ROS2). Strong interest in perception-driven navigation and learning-based control.

Education

2023 – Present — **M.Sc., Autonomous Systems and Robotics**, *Technical University of Darmstadt*, Germany
Core: Machine Learning, Reinforcement Learning, Deep Learning, Robot Learning, Computer Vision, Software Engineering

2022 – 2023 — **B.Eng., Mechanical Manufacturing**, *Furtwangen University of Applied Sciences*, Germany
GPA: 1.9 (German scale). Courses: Project Management, Precision Manufacturing, Business Administration

2019 – 2022 — **B.Eng., Mechanical Design, Manufacturing and Automation**, *University of Shanghai for Science and Technology*, China
Honors: Excellent Graduate; Second-class Scholarship

Experience

Deployed **Vision-Language-Action (VLA)** multimodal model for end-to-end inference, mapping natural language instructions to robot actions, achieving inference latency ¡ 200ms. Deployed **reinforcement learning policy models (PPO/SAC)** to robot platform, achieving real-time policy inference and action execution at 10Hz update frequency. Optimized model inference performance through **model quantization (INT8), knowledge distillation, and model pruning**, reducing inference time from 350ms to 180ms (48.6% improvement), GPU memory usage reduced by 35%. Designed fusion mechanism for visual features, language instructions, and action space, achieving end-to-end **multimodal perception-decision-control loop**, task success rate improved from 72% to 88%. Integrated VLA model and reinforcement learning policy on **ROS2 framework**, completed end-to-end system deployment, validated in simulation environment, supporting natural language-controlled robot manipulation tasks.
Results: 88% task success rate — Inference latency ¡ 200ms — Validated the effectiveness of multimodal models in robot control

Feb 2022 – Aug 2022 — **Laboratory Intern — Test Engineer Assistant**, *BorgWarner China Technical Center*, Shanghai, China
Executed **OEM standard** component measurement, assembly, and quality inspection, participated in laboratory automation and data acquisition process optimization. Reduced experimental error rate by ∼**12%**, improved detection efficiency by **15%**. Developed rigorous engineering experimental and quality control mindset, laying the foundation for subsequent robot hardware interface and sensor data fusion.

Selected Projects

Technical Skills

Programming	Python, C++, ROS2, Linux, Bash, MATLAB
AI & CV	PyTorch, TensorFlow, OpenCV, SLAM, Visual Servoing
Robotics	Navigation, Mapping, Motion Control, MoveIt!, Gazebo
Engineering	Mechanical Design, CAD (SolidWorks), 3D Printing, FEA
Tools	Git, Docker
Languages	English (Fluent), German (B1, TestDaF 16), Chinese (Native)

Achievements

Integrated AI perception with robot control for a real-time navigation demo (TU Darmstadt, 2025).

Delivered four robotics/vision projects across ROS2, CV, and ML with end-to-end ownership. Recognized as *Excellent Graduate* (USST, 2022).