Pengyuan Wang

Undergraduate
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Summary

I am currently a third-year undergraduate student at Zhejiang University, majoring in Robotics Engineering and guided by Prof. Qiuguo Zhu. My research interests lie primarily in Legged Robot and Reinforcement Learning. I am also passionate about exploring more research areas.

Education

2023 - 2027 Bachelor of Engineering in Robotics Engineering at **Zhejiang University**
College of Control Science and Engineering
Advisor: Prof. Qiuguo Zhu

Honors & Awards

2024, 2025 **First Prize**, National University Robot Competition "RoboMaster Super Match - National Championship"
2024 (National Top 4), 2025 (National Top 8)

2024 **First Prize**, Zhejiang University Robot Competition (Runner-up)

2024, 2025 **Third-Class Scholarship** (Top 20% Students), Zhejiang University

Research Experience

Humanoid Robot Control with Reinforcement Learning Mar 2025 - Present

- Developing running controllers for a humanoid robot using reinforcement learning
- Configured simulation environments and trained open-source models
- Designed reward functions to achieve stable locomotion
- Gained foundational understanding of neural networks and reinforcement learning
- Improved practical skills in simulation, algorithm design, and implementation using PyTorch and Isaac-Gym

High-Maneuverability Drone Control System Jul 2025 - Sep 2025

- Contributed to developing a drone control system integrating Jetson ORIN NX and nxtpx4 flight controller
- Implemented cascade PID architecture for decoupled position, velocity, and angular rate control
- Applied PPO-based reinforcement learning with domain randomization for sim-to-real transfer
- Achieved complex maneuvers including figure-eight trajectories
- Strengthened practical skills in embedded systems programming and ROS-based integration

Autonomous Navigation System Development Jul 2024 - Aug 2024

- Developed an autonomous navigation system for a wheeled robot using ROS under guidance of Prof. Yu Zhang
- Implemented LiDAR-based SLAM for mapping
- Integrated TEB and Far Planner for trajectory optimization
- Enabled autonomous navigation and mapping in laboratory setting
- Gained hands-on skills in the ROS ecosystem and practical understanding of SLAM and path planning

Projects

RoboMaster Competition: Infantry & Aerial Robot Control Systems Oct 2023 - Aug 2025

Led the electrical control development for Infantry and Aerial robots over two seasons. Responsibilities spanned from low-level hardware development (circuit design and soldering) to advanced software implementation. Applied and optimized classical control methods such as PID, LQR, and MPC to meet specific task requirements, achieving high-performance motion control. This experience solidified programming foundation and deepened interest in robot control through hands-on system integration and teamwork.

Vision-Based Waste Sorting Robot Aug 2024 - Sep 2024

Contributed to developing a mecanum-wheeled sorting robot integrating LiDAR SLAM, stereo depth camera, and OpenCV-based color recognition for autonomous waste classification and transportation. Implemented URDF modeling for Gazebo simulation and established ROS communication architecture for module integration. Strengthened practical skills in Linux-based robotics tools including RViz, Gazebo, and Docker.

Zhongkong Cup: Autonomous Line-Following Robot Mar 2024 - May 2024

As team leader, led the development of an autonomous line-following robot. Primarily responsible for mechanical design and control algorithm deployment. The robot utilized grayscale sensors for navigation and featured custom-designed mechanisms, including a bucket and robotic arm, to perform object manipulation tasks. Gained practical experience in mechanical modeling and control algorithm implementation.

Skills

Programming Languages	C/C++, Python, MATLAB
Robotics Tools	ROS, Gazebo, RViz, IsaacGym
Control Theory	PID, LQR, MPC
Machine Learning	Reinforcement Learning (PPO), PyTorch
Embedded Systems	STM32, Jetson ORIN NX, Embedded Linux