

Yiyang Shao

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EDUCATION

University of Science and Technology of China

B.S. in Modern Mechanics. Overall GPA: 3.74 / 4.30 (Ranking: 5 / 63)

Hefei, China

Sep 2021–Present

University of California, Berkeley

Exchange Program

Berkeley, CA, USA

Aug 2024–Present

Selected Coursework: **11 A+** (Mathematical Analysis, Linear Algebra, Theoretical Mechanics, Thermotics, Mechanics, Statistical Thermodynamics, Viscous Fluid Dynamics, Mechanics of Fluids in Porous Media, Mechanical Design Basis, etc), **18 A** (Computer Vision, Probability Theory and Mathematical Statistics, Function of Complex Variable, Elementary Fluid Mechanics, etc), **6 A-**

EXPERIENCES

UC Berkeley, Hybrid Robotics Group

Aug 2024–Present

- Research on humanoid locomotion control with Prof. Koushil Sreenath.
- Focus on humanoid whole-body control using reinforcement learning, imitation learning, and model predictive control.

Robomaster at USTC (Robotics Team & Club)

2022–2024

- Developed state estimation and optimal control for a wheeled-bipedal robot, 3D SLAM and navigation for an omnidirectional robot, and object detection and motion prediction for autonomous shooting.

RESEARCH PROJECTS

Humanoid Whole Body Control via Text Command

- Developed a whole-body controller for a humanoid robot through text command based on the teacher-student framework.
- Teacher policies are trained to mimic captioned reference motion from HumanML3D.
- A text-conditioned student policy is then distilled from the teacher policies using behavior cloning and finetuned through reinforcement learning to transit between motions.
- The resulting policy demonstrates the capability to perform sequential motions based on text commands. [VIDEO](#)

Learning for Safe Multiple Heterogeneous Quadcopter Control via Generalizable Barrier Certificate

- Developed a heterogeneous safe controller for quadcopters with a generalizable barrier certificate.
- Simultaneously learn the control barrier function and constrained control policy.
- Online system identification from observation history for heterogeneous adaptation. [VIDEO](#)

Geometry Variation Model Predictive Control for a Bipedal Robot

- Geometry representation of system dynamic, invariant to coordinate system and free from singularity.
- Variation-based linearization of system dynamic to ensure the discretized system is energy-conserving.
- Enable stable walking of a bipedal robot. [VIDEO](#)

State Estimation and Control of a Bipedal Robot

- Developed a robust state estimation and high-performance control algorithm for a wheeled-bipedal robot.
- Detect slipping based on the velocity difference of wheels' contact points with the ground in the inertial frame to adjust covariance in state estimation Kalman filter.
- Designed LQR controller based on whole-body dynamics. [VIDEO](#)

SLAM and Navigation of an Omnidirectional Robot

- Develop a navigation system for a mobile robot to navigate through uneven terrain.
- Enhance localization frequency and accuracy by integrating lidar, IMU, and encoder data using a Kalman filter.
- Analyze terrain traversability through point cloud segmentation. [VIDEO](#)

AWARDS

Grand Prize of Zhou Peiyuan Mechanics Competition at Provincial Level	Jun 2023
First Prize of RoboMaster 2023 The RoboMaster University Championship	Apr 2024
First Prize of RoboMaster 2023 RoboMaster University League	Jun 2024
First Prize of 2023 Mitsubishi Electrical and Automation Contest Eastern Region	Jun 2023
First Prize of 2023 SLAMTEC SLAM Autonomous Driving Challenge	Aug 2023
Second Place of 2023 USTC Artificial Intelligence Innovation Contest	Sep 2023
JAC NIO Scholarship	Oct 2022

SKILLS

Expertise	Deep Reinforcement Learning, Optimal Control, SLAM, Motion Planning
Programming	Python, C++/C, PyTorch, Matlab, Mathematica
Tool	ROS/ROS2, OpenCV, Git, Linux, Docker
Language	Mandarin, English (TOEFL 107)