Zhuoheng Wang

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Education

Tsinghua University, BS in Mechanics & Interdisciplinary Engineering — Aug 2022 – Present

- **GPA:** 3.89/4.0 (Rank top 10%)
- **Main Honors:** National Scholarship, Academic Excellence Scholarship, Taihu Scholarship for Future Technology, Science and Technology Innovation Excellence Scholarship
- **Coursework:** Basis of Control Engineering, Intelligent Robot, Theoretical Mechanics

Research Interests

Legged Robot Locomotion and Manipulation

Humanoid and Quadrupedal Robot

Robot Dynamics and Control

Research Experience

Learning Humanoid Ball Manipulation Through Legged Locomotion — Research Assistant
Robot Control Lab, Tsinghua University Advisor: Prof. Mingguo Zhao — Aug 2024 – Present

- Designed dribbling-related reward functions and utilized Isaac Gym simulator for training policies
- Transferred action policies trained in Issac Gym to MuJoCo for sim-to-sim validation
- Debugged the Nokov motion capture device to obtain the robot's pose and the soccer ball's position in the real world
- Deployed trained policies on the Booster T1 humanoid robot for sim-to-real experiments
- Currently trying to equip robots with skills of obstacle avoidance and active perception

SkyRover: Air-Ground Robots for Low-Altitude Air Delivery Scenarios — Research Assistant
DISCOVER Lab, Tsinghua University Advisor: Prof. Guyue Zhou — Jan 2024 – Aug 2024

- Created the ROS Gazebo simulation of the SkyRover, a versatile robot with the ability to perform both rover and drone locomotion
- Demonstrated SkyRover's ability of sensing, navigation and control to complete simple delivery tasks and verify the feasibility of low-altitude air delivery
- Studied hybrid motion planning algorithms based on 2.5D risk maps
- Led the team as the captain to show exceptional performance and win the Urban Air Transportation Challenge Championship

Peter: a Fully Automatic Fruit and Vegetable Peeling Machine Based on Arduino and Traditional Control Theory — Research Assistant
DISCOVER Lab, Tsinghua University Advisor: Prof. Guyue Zhou — Apr 2023 – Sep 2023

- Invented the mechanical structure of self-cleaning module and material transferring part in the peeling machine with Solidworks
- Successfully built the first prototype via 3D printing and ran a simple demonstration
- Our project was successfully accepted as a cultivation project of Tsinghua X-Lab

Internship

Booster Robotics, Motion Control Algorithm Engineer — Beijing, China
Nov 2024 – Present

- Established communication between the motion capture system around a soccer field and the humanoid robot, enabling the robot to perceive the position and orientation of any rigid body in the soccer field

Department of Mechanical Engineering, Tsinghua University, Teaching Assistant — Beijing, China
Aug 2024 – Jan 2025

- Solved students' problems, corrected assignments and organized penalty shootout & 1v1 competition in the course Humanoid Soccer Robot
- Our course has been selected as a model project of Tsinghua University for the combination of competition and teaching

Honors and Rewards

Excellent Poster in Tsinghua University's Undergraduate Academic Advancement Program, Tsinghua University — Dec 2024

National Scholarship, Tsinghua University (5/147) — Oct 2024

Academic Excellence Scholarship, Tsinghua University — Oct 2024

Top Eight in RoboCup 2024 Humanoid League KidSize Soccer Competition, Eindhoven, Netherlands (Team Leader) — Jul 2024

1st Place in RoboCup China 2024 Humanoid League KidSize Soccer Competition, Fujian, China (Team Leader) — May 2024

4th Place in RoboCup Asia-Pacific 2023 Humanoid League KidSize Soccer Competition, Pyeongchang, South Korea — Dec 2023

Taihu Scholarship for Future Technology, Tsinghua University — Dec 2023

Science and Technology Innovation Excellence Scholarship, Tsinghua University — Dec 2023

1st Prize in the 39th National Undergraduate Physics Competition, Beijing, China — Dec 2023

2nd Place in RoboCup China 2023 Humanoid League KidSize Soccer Competition, Fujian, China — Oct 2023

Activities

Tsinghua University TH-MOS Robot Soccer Team, Team Leader — Jan 2024 – Present

- Led the team to win the first championship in team history and become a world-class contender
- Designed the goalkeeper's saving skill and created its decision-making framework to enhance the team's defensive ability
- Corrected the striker's shooting direction based on global localization, significantly increasing the team's number of goals

Tsinghua University TH-MOS Robot Soccer Team, Team Member — Oct 2023 – Jan 2024

- Optimized gait parameters to improve robot's walking stability
- Optimized the parameters of the robot's kicking action to improve shooting skills

Professional Skills

Robotics: ROS, Issac Gym, MuJoCo

3D Modeling: Solidworks, AutoCAD

Programming: Python, C/C++, Matlab & Simulink