Zhuoheng Wang

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Education

Tsinghua University Aug 2022 – Present
Bachelor in Mechanics & Interdisciplinary Engineering

- **GPA:** 3.9/4.0
- **Main Honors:** National Scholarship (2025, 2024), Academic Excellence Scholarship (2024), Taihu Scholarship for Future Technology (2023), Science and Technology Innovation Excellence Scholarship (2025, 2023)

Research Interests

Humanoid Whole-Body Control, Control & Safety, Embodied Intelligence, Multi-Agent Collaboration

Publications

* denotes equal contribution

[1] SEEC: Stable End-Effector Control with Model-Enhanced Residual Learning for Humanoid Loco-Manipulation
Jaehwi Jang*, **Zhuoheng Wang***, Ziyi Zhou, Feiyang Wu, Ye Zhao
Submitted to ICRA 2026

[2] Dribble Master: Learning Agile Humanoid Dribbling Through Legged Locomotion
Zhuoheng Wang*, Jinyin Zhou*, Qi Wu
Submitted to ICRA 2026

Research Experience

Stable Humanoid Loco-Manipulation with Model-Enhanced Reinforcement Learning Advisor: Prof. Ye Zhao
LIDAR Lab, Georgia Institute of Technology Jun 2025 – Sep 2025

- Aiming to minimize end-effector acceleration for humanoid loco-manipulation tasks.
- Built RL training environments for upper-body end-effector tracking and stabilization and lower-body robust locomotion.
- Implemented RL-based sim-to-sim and sim-to-real pipelines for the Booster T1 robot.
- Developed MuJoCo-based environment for end-effector stability evaluation.
- Our method outperforms all the baselines and shows better robustness to diverse and demanding loco-manipulation scenarios.

Humanoid Soccer Dribbling with Reinforcement Learning and Active Sensing Advisor: Prof. Li Liu and Prof. Mingguo Zhao
Robot Control Lab, Tsinghua University Aug 2024 – Mar 2025

- Aiming to enable dexterous robot-object interactions with active sensing.
- Designed dribbling-related rewards and utilized Isaac Gym for training policies.
- Transferred policies trained in Issac Gym to MuJoCo for sim-to-sim validation.
- Deployed trained policies on the Booster T1 robot for sim-to-real experiments.
- Our dribbling policy achieves accurate ball velocity tracking with only 2.69% error in direction and 10.4% error in speed.

SkyRover: Air-Ground Robots for Low-Altitude Air Delivery Scenarios Advisor: Dr. Weibin Gu
DISCOVER Lab, Tsinghua University Jan 2024 – Aug 2024

- Created the Gazebo simulation of the SkyRover, a versatile robot with the ability to perform both rover and drone locomotion.
- Demonstrated SkyRover's ability of percepion, 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 — Advisor: Prof. Guyue Zhou
DISCOVER Lab, Tsinghua University — Apr 2023 – Sep 2023

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

Internship

Georgia Institute of Technology — Summer Intern
Jun 2025 – Sep 2025

- Conducted research on Stable Humanoid Loco-Manipulation with Model-Enhanced Reinforcement Learning.

Booster Robotics — Algorithm Engineer
Nov 2024 – Mar 2025

- 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
Aug 2024 – Jan 2025
Sep 2025 - Present

- Solved students' problems, corrected assignments, and organized penalty shootout & 1v1 competition in the course Humanoid Soccer Robot.
- Delivered a lecture on Humanoid Robot Locomotion Control.

Honors and Awards

National Scholarship, Tsinghua University (Top 3%) — Oct 2025, Dec 2024

Science and Technology Innovation Excellence Scholarship, Tsinghua University — Oct 2025, Dec 2023

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

Academic Excellence Scholarship, Tsinghua University — Dec 2024

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

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

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

Taihu Scholarship for Future Technology, Tsinghua University — Dec 2023

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

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

Activities

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

- 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 Humanoid Robot Soccer Team, Team Member — Oct 2023 – Jan 2024

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