Wu, Qi

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EDUCATIONAL BACKGROUND

Stanford University Stanford, CA 09/2023 – present
- *M.S. in Mechanical Engineering*

Tsinghua University Beijing, China 09/2019 – 07/2023
- *B.S. in Mechanical Engineering (Elite program)* Overall GPA: 3.80/4.0

PUBLICATION

- **Q. Wu**, C. Zhang and Y. Liu, "Custom Sine Waves Are Enough for Imitation Learning of Bipedal Gaits with Different Styles," *2022 IEEE International Conference on Mechatronics and Automation (ICMA)*, 2022, pp. 499-505, doi: 10.1109/ICMA54519.2022.9856382.

REASEARCH EXPERIENCES

Custom Sine Waves Are Enough for Imitation Learning of Bipedal Gaits with Different Styles 03/2022 – 05/2022
Undergraduate research, Advisor: Prof. Li Liu, Dept. of Mechanical Engineering, Tsinghua University.
- Applied deep reinforcement learning on the walking of the robot Cassie in simulation without complete references.
- Designed a reward that can encourage the robot to learn various gaits from simple sine wave references.
- Included in the Finalist of Toshio Fukuda Best Paper Award in Mechatronics (4/503) in *ICMA* 2022.

Adaptive Mimic: DRL of Parameterized Bipedal Walking from Infeasible References 11/2021 – 12/2021
Undergraduate research, Advisor: Prof. Li Liu, Dept. of Mechanical Engineering, Tsinghua University.
- Applied deep reinforcement learning on the walking of our own robot in simulation imitating existed references.
- Dived into theories of ZMP, Capture Point, and Hybrid Zero Dynamics to generate simple references.
- Designed a reward that can autonomously change the weight of imitating or exploring based on performance.
- Submitted a paper to L4DC as the second author (https://arxiv.org/abs/2112.03735).

Hierarchical Control for Osrich-like Robots Combining RL and Model-based Controller 06/2022 – 08/2022
Undergraduate research, Advisor: Prof. Ye Zhao, Dept. of Mechanical Engineering, Georgia Institute of Technology.
- Mounted a kinova-gen3 on robot Cassie mimicking an ostrich to explore bipedal loco-manipulation.
- Designed a hierarchical control with RL-based locomotion and model-based manipulation.
- Realized a chicken-head effect stabilizing its end-effector height within 1 cm.

Sim2real Transfer of a Differentiable Fluid Manipulation Environment 10/2022 – 11/2022
Undergraduate research, Advisor: Prof.Chuang Gan, MIT-IBM Waston AI Lab.
- Deployed learned policies from the differential physics simulator Fluidlab to real world.
- Programed in ROS to control robot Franka to make an ice cream.

PROJECT EXPERIENCES

Humanoid Robot for Soccer Game 01/2023 – 07/2023
Student Humanoid Robotics Group, group leader.
- Led the Tsinghua MOS team to participate in RoboCup 2023 in France and won the **Fourth** place.
- Programmed the robot to automatically detect the ball, approach it and kick it towards the goal to win.
- Specifically managed the robot hardware system, robot dynamic walking controller and multi-robot high level policy.
- Responsible for leading a team of 15 people, coordinating tasks and planning overall strategies.

Chinese Space Station Robotic Arm Model for Science Exhibition 11/2021 – 10/2022
Practice of Product Engineering Design Course Project, group leader.
- Designed and manufactured a model displaying how the arm can transport among adaptors on the station surface.
- Programed controllers, designed printed circuit boards and designed mechanical models with FEM strength check.
- The only course work exhibited at China Science and Technology Museum and covered by national major press.

PROFESSIONAL SKILLS

- Programming and Software: C / MATLAB / Python / ROS / SolidWorks / AutoCAD / ANSYS.
- Languages: TOEFL (108), GRE (V 156, Q 170, AW 4.0).

EXTRACURRICULAR ACTIVITIES

- Member of student robotics group in Tsinghua MOS team for RoboCup. 01/2021 – 07/2023
- Table Tennis Team Captain of Dept. of Mechanical Engineering at Tsinghua. 09/2021 – 09/2022
- Volunteer in the site of Vaccination against Covid-19. 03/2021 – 04/2021