Tiancheng Wu

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Education

Carnegie Mellon University *Pittsburgh, PA* Aug 2024 - Aug 2026 (Expected)

Master of Science in Robotics, Robotics Institute | GPA: 4.17/4.33
Advisor: Professor Zackory Erickson

Tongji University *Shanghai, China* Sept 2020 - June 2024

Bachelor of Engineering in Computer Science and Technology | GPA: 89.78/100.00

Publications

*: Equal Contribution, †: Equal Advising

Tiancheng Wu, Yufei Wang, David Held and Zackory Erickson. *Shelf manipulation via DMP-generated demonstrations.* In Preparation for Submission to *Robotics: Science and Systems.* (RSS 2026)

Junzhe Hu*, Jeong Hun Lee*, **Tiancheng Wu**, Guo Ning Sue, Jiahe Liao, Zackory Erickson, Zachary Manchester and Carmel Majidi. *Spatiotemporal Stiffness Modulation for Efficient Aquatic Robot Locomotion.* In Submission to *Nature Partner Journal Robotics.* [Paper]

Divyam Goel, Yufei Wang, **Tiancheng Wu**, Helen Qiao, Pavel Piliptchak, David Held† and Zackory Erickson†. *Geometric Red-Teaming for Robotic Manipulation.* Accepted to *Ninth Annual Conference on Robot Learning.* Oral Presentation. (CoRL 2025) [Paper] [Website]

Yang Jiao, Kai Yang, **Tiancheng Wu**, Chengtao Jian and Jianwei Huang. *Provably convergent federated trilevel learning.* Accepted to *The Thirty-Eighth AAAI Conference on Artificial Intelligence.* (AAAI 2024) [Paper]

Yang Jiao, Kai Yang, **Tiancheng Wu**, Dongjin Song, Chengtao Jian. *Asynchronous distributed bilevel optimization.* Accepted to *The Eleventh International Conference on Learning Representations.* (ICLR 2023) [Paper]

Research Experience

Shelf Manipulation via DMP-generated demonstrations Sept 2024 - Now

Advisor: Prof. Zackory Erickson, Carnegie Mellon University

- Developed a synthetic data-generation system leveraging Dynamic Movement Primitives (DMPs) to transform few human demonstrations into large-scale datasets for manipulation tasks
- Trained a point-cloud-based hierarchical imitation-learning policy on large-scale synthetic demonstrations, enabling zero-shot real-world manipulation of diverse objects on a cluttered shelf

Generative simulation for Physical Human-Robot Interaction June 2025 - Now

Advisor: Prof. Zackory Erickson, Carnegie Mellon University

- Created a pipeline to convert SMPL-X human models into URDFs with shape variation, yielding soft, actuated bodies suitable for high-fidelity physical interaction
- Implemented a Vision-Language Model–guided pipeline that synthesizes SMPL-X human poses and interaction motions with robots across diverse, realistic furniture and scene configurations

Distributed Optimization July 2022 - June 2024

Advisor: Prof. Kai Yang, Tongji University

- Designed and implemented an asynchronous distributed optimization framework built on PyTorch, Docker, and RabbitMQ, enabling scalable hyper-parameter tuning and domain adaptation tasks
- Applied the Augmented Lagrangian method to refine the optimization algorithm, yielding improved performance on the IJCNN1 and Covertype datasets

Internship Experience

NIO CO., LTD. *Shanghai, China* Apr 2023 - Aug 2023
Test Automation Engineering Intern

- Maintained and updated 300+ automated Python test cases for electric-vehicle cockpit software, covering modules such as seat massage, heating, ventilation, safe-box control, and shortcut operations
- Engineered Python decorator–based mechanisms in the automated testing framework to enable adaptive test behaviors across car configurations and vehicle models.

Projects

Efficient Swimming Robot via Spatiotemporal Stiffness Optimization Jan 2025 - Sept 2025
Course Project of 16-745 Optimal Control and Reinforcement Learning
Instructor: Prof. Zachary Manchester, Carnegie Mellon University

- Optimized the spatiotemporal stiffness profile of a bio-inspired swimming robot using a Direct Collocation formulation in MATLAB to maximize propulsion efficiency

Tongji Superpower in the RoboMaster University Championship 2023 Oct 2021 - July 2023
Leader of Electronic Control Group

- Engineered and implemented PID velocity control on an STM32 microcontroller for a Mecanum drivetrain, enabling smooth and responsive omnidirectional motion from remote velocity commands
- Integrated a Pixy vision camera via SPI with a robotic gripper, enabling autonomous detection and grasping of game pieces

Extracurricular Activities

FIRST Robotics Colorado Regional Volunteer Official Scorer Mar 2025

FIRST Robotics China Off-season Volunteer Control System Advisor Aug 2023

FIRST Robotics Team 6907 Mentor of Software Development 2020 - Now

Honors and Awards

3rd Prize in the RoboMaster University Championship 2023 Aug 2023

Academic Scholarship for outstanding performance, Tongji University Dec 2021, Dec 2022

Technical Skills

Language	English (Fluent), Mandarin (Native)
Programming Languages	Python, C, C++, C#, Java, Julia, SQL, MATLAB
Professional Software	Visual Studio, VS Code, LaTeX, Docker, Git, Blender
Libraries	OpenGL, FreeRTOS, CUDA
Frameworks	PyTorch, .NET, Spring, Android, React, Django