

Todd (Chaoyuan) Zhang

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Education

University of Washington

Seattle, WA, USA

Bachelor of Computer Science; (Overall GPA:3.96/4.0 | Major GPA: 3.93/4.0)

Sept 2021-Jun 2025

- **Honors:** Dean's List (2021-2024)
- **Courses:** *Artificial Intelligence, Algorithm-Based Computer Vision, Probabilistic Robotics, Autonomous Robotics, Software Development Capstone-Robotics*
- **Technical Skills:** Programming Language: C++, Python, Java, C; Tools: NVIDIA Isaac Sim, OpenUSD, PyTorch, ROS, Git

Publication

[1] Wayne Wu, Honglin He, **Chaoyuan Zhang**, Jack He, Seth Z. Zhao, Ran Gong, Quanyi Li, Bolei Zhou. Towards Autonomous Micromobility through Scalable Urban Simulation. *Submitted to IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR)*, 2025.

[2] **Chaoyuan Zhang**, Zhaowei Li, Wentao Yuan, Zhihao Zhao. Vote-Tree-Planner: Optimizing Execution Order in LLM-based Task Planning Pipeline via Voting Mechanism. *Presented at Robotics: Science and Systems Workshop on Task Specification for General-Purpose Intelligent Robots (RSS-W: TaskSpec)*, 2024.

Internship

DEEP Robotics, Hangzhou, Zhejiang, China, Product Team Intern

Aug 2023-Sept 2023

- Participated in tests of the Jueying X20 robot dog in various environments to assess and improve its robustness
- Prepared for the product launch, and contributed to the production of the robot dog's demo

Research Experiences

Project: URBAN-SIM, Research Assistant for Prof. Bolei Zhou, University of California, Los Angeles Jul 2024-Nov 2024

- **Asset Converter Development:** Developed scripts to convert 2000+ OBJ/GLB files into USD format, streamlining the process of setting up simulation environments.
- **Dynamic Environment Implementation:** Enabled training of robots for social navigation in large environments with 100 human NPCs on a 208m x 208m district. Reduced the time spent on generating NPCs' paths by 50%. Enabled robot-NPC interaction using Waymax library.
- **Static Environment Development:** Built the initial static environment to train an Anymal-C robot dog on a point navigation task. Successfully trained the dog in 500 iterations. Participated in developing additional static environments using procedural generation to simulate large-scale street blocks.
- **Performance Optimization:** Improved the FPS of the static environment by 450%. Enhanced the position update speed of 100 human NPCs by 700%. Achieved animation switching speed for 100 human NPCs in 0.0005s. Enabled simulation of 35 street blocks of 208m x 208m with one GPU.

Project: Vote-Tree-Planner, Advised by Dr. Wentao Yuan, Supervised by Prof. Dieter Fox, UW Apr 2024- Jun 2024

- **Pipeline Design and Implementation:** Designed and implemented the Vote-Tree-Planner by introducing a voting mechanism based on Prog-Prompt and Tree-Planner; Enhanced robots' ability to break down complex, abstract instructions into executable plans, improving overall stability and success rate in task execution.
- **Performance Improvement:** Increased success rate by 26%. Improved total proportion of achieved goal conditions by 23%. Reduced the length of plans by 33% to 60% compared to Prog-Prompt while completing the same or higher number of goal conditions.

Project: RFGANM+PSSR, Undergraduate Research Assistant for Prof. Dan Fu, UW

Sept 2022-Sept 2023

- **Model Integration:** Integrated RFGANM and PSSR models by replacing the generator of RFGANM with PSSR Res-U Net. Substituted the degradation function of RFGANM with that of PSSR to better simulate low-resolution images in real-world scenarios using provided high-resolution images.
- **Model Training:** Trained the new model and enhanced the smoothness of generated high-resolution images.

Academic Projects

Robotics Course Project: MUSHR Car

Mar 2024-Jun 2024

- Implemented a particle filter, various controllers and a lazy A* planner, combined these functionalities into a program that drives the MUSHR Car to navigate to a given point.

Robotics Capstone Project: Stretch Care

Jan 2024-Mar 2024

- Led a team of five to build a pipeline from scratch. The pipeline enables HelloRobot's Stretch robot to automatically collect patients' body temperature and present the data through a highly accessible UI.
- Conducted survey and received valuable feedback from a medical industry participant after developing the program.