

Tianhao (Stan) Wu

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Education

University of Southern California, Los Angeles, CA Jan 2021 - Dec 2024
B.S. in Computer Engineering and Computer Science Major GPA: 3.976 / 4
B.S. in Applied and Computational Mathematics Major GPA: 3.948 / 4
Cumulative GPA: 3.944 / 4

Research Experience

Safe AI Lab, CMU, remote Sep 2024 - present

- Researching on multi-agent reinforcement learning with application in autonomous driving

Deep Vision Lab, CUHK, HK Jun 2024 - Aug 2024

- Developed a novel LLaVA model by introducing cross-attention layers for image-text fusion
- Familiarized with the Hugging Face Transformers library and deployed models on a cluster
- Specialized in large vision-language models and efficient fine-tuning techniques

Research Assistant, USC, Los Angeles, CA Jul 2023 - Jan 2024

- Assisted in developing vision models for animal action recognition
- Employed SAM to segment 15000 images and converted the dataset into COCO format
- Trained Mask R-CNN, Faster R-CNN, and HRNet models for pose estimation

Safe and Intelligent Autonomy Lab, USC, Los Angeles, CA Aug 2022 - May 2023

- Gained expertise in Hamilton-Jacobi Reachability for ensuring safety in autonomous systems
- Implemented a 2D system using DeepReach and obtained the correct Backward Reachable Tubes
- Improved the violation rate of DeepReach on a 9D system by 0.57% and completed a paper

Intelligent and Autonomous Systems Lab, UCI, Irvine, CA Jun 2022 - Aug 2022

- Developed an autonomous drone capable of detecting and avoiding static obstacles
- Led the team in dataset collection, model training, sensor configuration, drone assembly, scripting, flight simulation, and field testing

Publications

Enhancing the Performance of DeepReach on High-Dimensional Systems through Optimizing Activation Functions
Qian Wang*, **Tianhao Wu***. arXiv preprint, 2023. [\[pdf\]](#) (* indicates equal contributions)

Honors and Awards

MHI Undergraduate Scholar, ECE Dept. (**Top 5** selected for research excellence and potential) 2024
Engineering Honors Program 2023
Academic Achievement Award 2023
CURVE Fellowship 2022
Lenore B. Kreiger Endowed Scholarship for Math 2022
Viterbi/Dornsife Dean's List 2021 - 2024

Work Experience

Undergraduate Teaching Assistant, USC, Los Angeles, CA

- Contributed to over 300 course-related discussions on Piazza in total
- CSCI 102: Fundamentals of Computation (**Lead Undergraduate TA**) Spring 2022 - Spring 2024
 - Assisted the professor with grading, coordinating logistics, and proctoring exams
 - Led weekly office hours (2 hrs) and lab sessions (1 hr) to help with programming assignments
- EE 109: Introduction to Embedded Systems Fall 2023
 - Supported students with embedded system projects during office hours and labs
- CSCI 360: Introduction to Artificial Intelligence Spring 2023
 - Guided students in understanding AI algorithms and solving homework problems

MHI Undergraduate Research Hub (Co-organizer), USC, Los Angeles, CA

Aug 2023 - May 2024

- Hosted biweekly events aimed at strengthening ECE's undergraduate research community
- Organized research talks and led panels on career pathways in academic research

CS@SC Summer Camp Teaching Assistant, remote

Jun 2022 - Aug 2022

- Conducted six 20-hour programming workshops for K-12 students, teaching Python, Scratch, and Scratch Jr.

Mastery Learning Hour (Volunteer), remote

Jan 2022 - May 2022

- Tutored grade school students in math problems for 4 hours per week

Projects

- Implemented music genre classification with machine learning algorithms [\[report\]](#)
- Built a first-person view drone from scratch [\[demo video\]](#)
- Built a hexapod robot controlled by Raspberry Pi [\[demo video\]](#)
- Developed a fall detection device [\[demo video\]](#) [\[report\]](#)
- Developed an ultrasonic rangefinder with Arduino Uno [\[demo video\]](#)

Skills

Programming/Tools: Python, C/C++, MATLAB, Verilog HDL, LaTeX, Git, Linux

Research: Computer Vision, Robotics, Machine Learning, Learning-Based Control

Languages: English (Bilingual Proficiency), Mandarin Chinese (Native), Spanish (Elementary)