Zhiheng Jiang

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Education

University of California, Los Angeles
Bachelor of Science in Computer Science and Engineering (GPA: 4.00 / 4.00, Dean's Honors List) *Los Angeles, CA*

- **Academics:** Data Structures and Algorithms, Software Construction, Multivariable Calculus, Differential Equations, Discrete Math
- **Activities:** IEEE Pocket Racers (Computer Vision and Robotics), ACM AI (Reinforcement Learning)

Experience

Institute for Creative Technologies, University of Southern California June 2025 – Sep 2025
Visiting Academic *Playa Vista, CA*

- Conducting research at the Human-inspired Adaptive Teaming Systems (HATS) lab, advised by Dr. Volkan Ustun
- Working on the design and evaluation of scenario generation experiments using LLMs for Multi-Agent Reinforcement Learning

Structures-Computer Interaction Lab at UCLA Oct 2024 – June 2025
Undergraduate Researcher *Los Angeles, CA*

- Advised by Prof. M. Khalid Jawed on using Large Language Models for Robotics to develop digital twin simulation of springs
- Worked with collaborator from Amazon to develop multi-agent, multimodal LLM-robot agentic workflows with agentic memory
- Used Discrete Elastic Rod C++ OpenGL simulations to train reduced-order physics-constrained Neural Networks using PyTorch
- Developed a control system connecting LLM workflows, Intel RealSense video input and ROS-based Sawyer Collaborative Robots
- Deployed computer vision algorithms using OpenCV and ArUco marker detection to capture dynamics of deformable structures

Institute of High Performance Computing, A*STAR June 2020 – Feb 2022
Research Assistant *Singapore*

- First Author publication with Dr. Hoai Nguyen Huynh from the Agency for Science, Technology and Research (A*STAR)
- Developed averaging algorithm using Louvain Community Detection to improve community stability for Social Network Analysis
- Performed text mining using Natural Language Tool Kit to extract meaningful textual information from genre communities
- One of the top 27 projects to receive the Gold Award at the prestigious Singapore Science and Engineering Fair

Publications and Talks

[1] Mason Zhao, **Zhiheng Jiang**, Henry Braid, M. Khalid Jawed, "LLM-Guided Model Development of Elastic Structures" *UCLA Undergraduate Research Week 2025 (Presenters: Zhiheng Jiang and Henry Braid)*.

[2] **Zhiheng Jiang** and Hoai Nguyen Huynh, "Unveiling music genre structure through common-interest communities" *Social Network Analysis and Mining*, Vol. 12, No. 35 (2022).

Projects

When2Fly Scheduling Web App | *ReactJS, ExpressJS, CI/CD, PostgreSQL, Git, GitHub Actions, Vercel, Render* 2025

- Designed a full-stack web app for Software Construction Lab Final Project, to connect students for Uber ride-sharing to LAX
- Developed comprehensive backend integration tests using Jest and Supertest to validate REST API endpoints (including authentication, CRUD and time-based queries), integrating them into a CI/CD pipeline for automated testing and deployment.
- Ensured robust foreign key and data integrity constraints in a PostgreSQL environment through automated testing.

ACM AI - Atari Reinforcement Learning Project | *Reinforcement Learning, OpenAI Gym, CNNs, PyTorch* 2025

- Developed Deep Reinforcement Learning algorithms using REINFORCE and Deep Q-Networks (DQN) to play Atari games
- Experimented with CNN and MLP-based RL function approximators to play Atari Surround on OpenAI Gym

IEEE Pocket Racers (Autonomous Driving) | *Computer Vision, PyTorch, Raspberry Pi, Soldering* 2024-2025

- Using Convolutional Neural Networks to enable autonomous driving on a self-built Raspberry Pi and PCB car
- Performed noise reduction methods using image kernels and Gaussian blurring for blob detection using OpenCV
- Soldered PCB board with sensors and circuitry such as Hall Effect Encoders, ESCs, Voltage Regulators and DC motors

Today I Learnt AI Competition –Advanced Category Champion | *LLMs, VLMs, Finetuning, PyTorch, HuggingFace, VertexAI, Docker* 2024

- Team leader of champion team, winning 10,000 SGD (7,500 USD) cash prize competing against 60 university-level finalist teams
- Finetuned large deep learning models with high test scores, for audio (99.5%), Vision-Language Models and object detection (86.3%) and Transformer Question Answering (99.9%), with quantization, to achieve high inference speeds on a DJI robot
- Finetuned SOTA models such as YOLO, DETR, RoBERTa and OpenAI Whisper on VertexAI and Google Cloud Platform (GCP)
- Prize presented by Senior Minister of State for Defence of Singapore, Heng Chee How

Technical Skills

Languages: Python, C++, MATLAB, Java, Javascript, LaTeX
Technologies: PyTorch, Tensorflow, HuggingFace, LangGraph, LangChain, Scikit-Learn, Pandas, Numpy, ReactJS, NodeJS, FastAPI
Concepts: Large Language Models, Generative AI, Machine Learning, Computer Vision, Natural Language Processing