

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)

Los Angeles, CA

- **Academics:** Intro to CS (C++), Single and Multivariable Calculus, Mechanics | Dean's Honors List (Fall 2024)
- **Activities:** IEEE Pocket Racers (Computer Vision and Robotics), ACM AI (Reinforcement Learning)

Experience

Structures-Computer Interaction Lab at UCLA

Oct 2024 – Present

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++ simulations to train Physics-Informed Neural Networks and Neural Ordinary Differential Equations
- Developed an integrated control system connecting LLM workflows, OpenGL video input and Robot Operating System on Linux
- Deployed real-time computer vision algorithms using OpenCV and ArUco marker detection to capture slinky dynamics

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)
- Improved upon Louvain Community Detection algorithm for Social Network Analysis, to near-perfect consistency
- One of the top 27 projects to receive the Gold Award at the prestigious Singapore Science and Engineering Fair

School of Physical and Mathematical Sciences, Nanyang Technological University

June 2018 – Jan 2019

Research Assistant

Singapore

- Advised by Prof. Cheong Siew Ann on Natural Language Processing research, studying topic modeling and agency networks
- Analyzed semantic and syntactic sentence patterns using Part-Of-Speech tagging, Sentiment Analysis and directed graphs
- Presented paper at Singapore Youth Science Conference (Distinction) and International Science Youth Forum

Publications

- [1] **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

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

2025

- Developing 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 games (eg. Lunar Lander) 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 to deploy on a robot
- Finetuned SOTA models such as YOLO, DETR, RoBERTa and OpenAI Whisper on VertexAI and Google Cloud Platform
- Prize presented by Senior Minister of State for Defence of Singapore, Heng Chee How

AI Capture the Flag | *Adversarial Image, Model Inversion, Prompt Injection, Model Fingerprinting, Diffusion Models*

2024

- Team Leader in a Jeopardy style Capture the Flag to collect flags by overcoming AI model security challenges
- Emerged 42nd out of almost 400 university-level teams, solving 7 challenges over 48 hours

Cerebral Beach Hacks (LA Tech Week 2024) | *Next.js, FastAPI, Claude LLM, Git*

2024

- Built full-stack web app EV.AI from scratch in 24 hours under Most Fundable Startup Track in the GenAI Hackathon
- Used LLM Agents to simulate customers in a new market, and provide customized feedback to businesses

International Mathematical Modelling Challenge - Top 2 Internationally | *Scikit-Learn, NetworkX, Genetic Algorithms*

2021

- First Author of winning paper, using techniques such as Floyd-Warshall and Genetic Algorithms to solve math modelling problem
- Featured during the 14th international Congress on Mathematical Education in Shanghai, China

Technical Skills

Languages: Python, C++, MATLAB, Java, Javascript, LaTeX

Technologies: PyTorch, Tensorflow, HuggingFace, LangGraph, LangChain, Scikit-Learn, Pandas, Numpy, React.js, FastAPI

Concepts: Large Language Models, Generative AI, Machine Learning, Computer Vision, Natural Language Processing