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++), 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*
- Working with Prof. M. Khalid Jawed on using LLMs for Robotics to develop digital twin simulation of springs
- Developed multi-agent, multimodal LLM agentic workflows for robotic tasks using different forms of agentic memory
- Developed advanced physics simulations and trained Neural Ordinary Differential Equations on robotic data
- Deployed real-time computer vision algorithms using OpenCV and ArUco marker detection
- Created a FastAPI robot server on top of Robot Operating System (ROS) on Linux platform to control robot

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

Research Assistant   *Singapore*
- Conducted research 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 close to 100% consistency
- 1st Author publication in Springer Social Network Analysis and Mining, Volume 12, Article 35
- 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*
- Conducted Natural Language Processing research with Assoc Prof Cheong Siew Ann
- Used Part-of-Speech Tagging and Sentiment Analysis to construct agency networks of story characters
- Presented paper at Singapore Youth Science Conference (Distinction) and International Science Youth Forum
- Finalist at the Singapore Science and Engineering Fair

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

Today I Learnt AI Competition –Advanced Category Champion | *LLMs, VLMs, Finetuning, PyTorch, HuggingFace, VertexAI, Docker*
- Clinched team champion with 10,000 SGD (7,500 USD) cash prize amongst 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 high inference speeds to deploy on a robot
- Prize presented by Senior Minister of State for Defence of Singapore, Heng Chee How

International Mathematical Modelling Challenge – Top 2 Internationally | *Scikit-Learn, NetworkX, Genetic Algorithms*
- Determined the Greatest of All Time in individual and team sports, using mathematical modelling
- Featured during the 14th international Congress on Mathematical Education in Shanghai, China

AI Capture the Flag | *Adversarial Image, Model Inversion, Prompt Injection, Model Fingerprinting*
- Participated 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*
- 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

ACM AI - Atari Reinforcement Learning Project | *Reinforcement Learning, OpenAI Gym, PyTorch, SSH - In Progress*
- Developing Reinforcement Learning algorithms using REINFORCE and Actor-Critic algorithms to play Atari game

IEEE Pocket Racers (Autonomous Driving) | *Computer Vision, PyTorch, Raspberry Pi, Soldering - In Progress*
- Using Convolutional Neural Networks to enable autonomous driving on a Raspberry Pi device

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