

Jie Wang

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EDUCATION

University of Pennsylvania (GPA: 3.57/4.0) Philadelphia, PA
M.S.E Robotics, Advisor: [Prof. Dinesh Jayarama](#) Aug 2024 – Jun 2026
Zhejiang University (GPA: 3.83/4.0) Haining, China
BEng. Electronic and Computer Engineering, Advisor: [Prof. Said Mikki](#) Aug 2020 – Jun 2024
University of Illinois at Urbana-Champaign (GPA: 3.50/4.0) Urbana, IL
BSc. Computer Engineering Aug 2020 – May 2024

SKILLS

- Programming:** Python, C/C++, MATLAB, x86, Typescript, FPGA & SystemVerilog,
- Software:** Git, PyTorch, MMEngine, ROS, Langchain, CMake, Latex, Markdown
- Hardware:** Franka Emika Panda Robot (DROID), GELLO, 3DSpaceMouse, UR3e Arm, ZED, RealSense
- Simulator:** IssacSim, IssacLab, MuJuCo, Robosuite, CARLA

WORK EXPERIENCE

[International Digital Economy Academy](#)

[Computer Vision & Robotics Department](#), Mentor: [Dr. Xiaoke Jiang](#) Shenzhen, China
Multimodal Machine Learning Engineering Intern Jun 2024 – Sep 2024

- Optimized multi-threaded feature extraction module by diagnosing I/O bottlenecks and improving HDF5 file writing efficiency, reducing processing time per image by 16.7% on single NVIDIA RTX 3090.
- Developed a Python utils module for feature extraction with atomic writing on a producer-consumer arch.
- Integrated Grounding DINO 1.6, the SOTA open-set detection model, as a vision encoder to train on a large-scale human-centric video-caption dataset with over 120K videos.
- Trained a LLaVA-like 6-layer decoder model for human behavior recognition across variable-length videos using 16 parallel NVIDIA RTX 3090 GPUs. Conducted ablation study on 8 * NVIDIA A100 GPUs with LLaVA 7B and Florence-2.

PROJECT EXPERIENCE

VLMs-based Robotics Manipulation via Diffusion Policy

[Perception, Action, & Learning Lab](#), Mentor: [PhD Candidate Jason Ma](#) Philadelphia, PA
Graduate Research Assistant Sep 2024 – Now

- Reproduced [ReKep](#) on a Mobile Franka Arm Platform with DROID, conducted experiment for [ZeroMimic](#) as a baseline.
- Reproduced [SPHINX](#) on same robot for hybrid salient point control using transformer and diffusion policy.
- Reproduced [\$\pi\$ 0-FAST-DROID](#) within GRASP Lab, led a full evaluation on 200+ trials, report can be found [here](#).
- Opensource a [video processing tool](#) for the lab and upgrade the light setup system for Franka Kitchen.
- Implement [omni_depth](#), a RGBD camera prompt depth estimation tool for multiple objects 3D tracking.
- Leading a project solving complex spatiotemporal reasoning task like brew a cup of espresso in the wild.

RL-based High-Speed Drone Racing on IssacSim

[CIS519 Applied Machine Learning](#), Advisor: [Prof. Antonio Loquercio](#) Philadelphia, PA
Oct 2024 – Nov 2024

- Built a drone racing simulation with curriculum tracks (ellipse, split-S, UZH) using OmniDrones on IsaacSim 4.1 & IssacLab.
- Designed a PPO-based reward function, achieving 40.7% success rate and 7.94 m/s average speed on a 127m track.
- Trained 150M frames across 250 parallel environments, completing in 8 hours on 2 x NVIDIA A6000 GPUs.
- Explored domain randomization and trajectory-based methods for robustness, getting full score in final demo.

Senior Design: Intelligent Pour-Over Coffee Machine

Team Leader & Embedded System Architect, Advisor: [Prof. Said Mikki](#) Haining, China
Feb 2024 – May 2024

- Innovated a novel pour-over mechanism for an automated coffee machine from sketch.
- Guaranteed food-grade quality coffee; Custom power supply with emergency stop system.
- Implemented a finite state machine for closed-loop control and user interaction using Raspberry Pi 5B.
- Conducted user study, unit tests and verification to ensure functionality, getting full demo mark with [thesis here](#).

Intelligent Vehicle Risk Warning System Integrated with Large-Language Models

Research Assistant, Advisor: [Prof. Wei Xiang](#) Hangzhou, China
Jul 2023 – Oct 2023

- Developed an LLMs-based framework for human-machine co-driving scenario, analyze potential risk from monocular video, connecting to a dynamic risk warning system interface.
- Refined HCI design and the eye-movement technology and risk alert design; completed a 41-person user experience experiment based on a simulated cockpit and handled the result data processing.
- Wrote, edited, proofread the manuscript the paper, "[Visionary Co-Driver: LLMs Enhance Driver Risk Perception with ARHUD](#)", as the third author, which is submitted to top-tier HCI journal IJHCS.

PUBLICATION & PATENT

- Wang, J. Qiu, X., Huang, J., & Ke, R. (2024). "智能手冲咖啡机: An Intelligent Pour-Over Coffee Machine Design." ZJU-UIUC Institute. China Patent No. CN 216972404. Status: Application Pending.
 - Xiang, X., Lei, Z., Wang, J. Zheng, Q., Huang Y. "Visionary Co-Driver: LLMs Enhance Driver Risk Perception with ARHUD"
 - Zhu, X., Li, Z., Jiang, Y., Xu, J., Wang, J., & Bai, X. [Oral] "Real-time V2V Communication Network Cooperative Control System through Distributed Database," Accepted for oral presentation at the 9th International Congress on Information and Communication Technology, London, UK. Jan. 2024.
 - Wang, X., Wang, J., (2022). "终端机和一体机: A Thin Client and All-in-One Computer Design.", Shenzhen Weidi Cloud Technology Co., LTD. China Patent No. CN 216852698 U. Issued: June 28, 2022.
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COURSEWORK

WiFi Heatmap Scanner: Communication Networks Wireless Project

Urbana, IL

Product Manager, Advisor: Prof. Deepak Vasisht

Apr 2023 – May 2023

- Developed an [open-source Python tool](#) for Wi-Fi network analysis.
- Analyzed [campus AP roaming mechanisms and generated heatmap of UIUC Thomas M. Siebel Center](#).
- Collaborated with the UIUC IT Network team to propose recommendations for network environment improvements.

Simulation and Modeling of Unmanned Vehicle Safety Test for Apollo D-kit

ROS, Python, C++, Carla

- Assemble the Lidar, Radar and Camera module for Baidu Apollo D-kit Self-driving Test Vehicle.
- Constructed the high-resolution Lidar map of ZJU international campus via Baidu Apollo D-kit Vehicle.
- Proposed a perception range model for Connected and Automated Vehicles in traffic state estimation based on recorded data and literature review, which is used for the adaptation of D-kit Vehicle.

'MentOS': Multi-terminal Operating System

C, x86 assembly

- Developed a Linux-like operating system kernel using C and x86, supporting paging virtual memory, fully functional IDT, GDT, and i8259-based interrupt controller, etc.
 - Wrote device driver such as Real Time Clock, keyboard, Programmable Interval Timer and read-only file system.
 - Used x86 to establish the system call linkage between user-level program and kernel, passing all test cases provided by the course. Furthermore, realized single CPU task scheduling and multiple terminals switching.
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ACADEMIC CONTEST

2023 Shell Eco-marathon Autonomous Programming Competition

ROS, Carla, Python,

- Developed path planning, perception, and control modules for simulation autonomous vehicles using the Robot Operating System (ROS) stack provided by the competition.
- Utilized the CARLA simulator with the Unreal Engine to test our vehicle in a simulated environment, with the goal of achieving the most efficient path planning according to the competition's ranking criteria.

2022 International Mathematical Contest in Modeling (Honorable Mention)

MATLAB, Python

- Addressed the issue of water scarcity in the Colorado River in the United States by constructing a mathematical model for water-to-electricity supply using dynamic programming and Monte Carlo algorithm.
- Used SPSS time series analysis tools to predict water demand for each state, generated a demand matrix for the water system. By sensitivity analysis, demonstrated strategies for addressing conditions such as rapid depletion of water resources, involvement of renewable energy technologies, and application of conservation measures.

2021 DJI RoboMaster University Robotics Competition

Python, PyTorch, C/C++

- Assisted in developing and optimizing vision algorithms for object detection via YOLOv4, contributing to auto-aiming and shooting system for real-time target engagement, improving hit accuracy by 20%.
 - Supported the integration of vision systems on Jetson Nano with embedded platforms on DJI manifold2, achieving a 30 FPS during live competition on the industrial camera.
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TEACHING EXPERIENCE

Head Teaching Assistant in MATH213: Introduction to Discrete Mathematics

ZJU-UIUC Institute

Instructor: [Prof. Meng Zhang](#)

Fall 2023

Teaching Assistant in PHIL 206: Early Modern Philosophy

ZJU-UIUC Institute

Instructor: [Prof. Shao Kai Tseng](#)

Spring 2024

CLUB

Member, [Meta Robomaster Team](#) at ZJU

Oct 2020 – Oct 2021

Vice President, ZJUICMUN at ZJU

Feb 2021 – Jun 2022

Member, [Illini EV Concept](#) at UIUC

Feb 2023 – Jun 2023

Founder & President, [PhiloCoffee Club](#) at ZJU

Aug 2023 – Aug 2024

Member, Robotics Entrepreneur Club at UPenn

Oct 2024 – Now

Member, Penn Coffee Club

Oct 2024 – Now

Miscellaneous: Specialty Coffee, Photography, Cook, Gym, Steam, Chinese Material Art, HEMA Longswords
