Guanquan Wang

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Education

University of Electronic Science and Technology of China (UESTC) Sep 2021 – Jun 2025

Bachelor in Electronic Information Engineering
GPA: 3.5/4.0, Honours of the Second Class(Division i)
Coursework: Dynamic Control, Artificial Intelligence, Signal Processing, Analog Circuit, Digital Circuit
Graduation Project: Diffusion Policy for Robotic Manipulation: Stochastic Optimization of Adaptive Action Sequences in Dynamic Environments

University of Washington Sep 2025 – Present

Master in Electrical & Computer Engineering

Research Experience

Multimodal multi-classification model based on binary classification Aug 2023 – Nov 2024
Image Processing Lab, UESTC, Supv: Prof. Bing Zeng Chengdu, China

- Systematically studied multimodal knowledge and pre-trained models, successfully reproducing and mastering models such as **Vision Transformer (ViT)**, **CLIP**, and **ResNet**.
- Applied a binary classification network as a post-processing module to a multi-class model, focusing on using **multimodal pre-trained models** to improve accuracy and optimize the model through various network combinations.
- Successfully optimized pre-trained models, achieving significant improvements in results compared to traditional multi-class networks.

Internship

Research Intern Jan 2025 – Apr 2025
Midea Group AI Lab, Supv: Mr. Yichen Zhu Shanghai, China
Project Link: github.com/GqWang0617/pi0/tree/master

- Built and proficiently used the **MuJoCo** and **DISCOVERSE** end-to-end embodied intelligence simulation platform, employing **3DGS** rendering and modeling to simulate robots in complex, high-fidelity environments, preparing for subsequent real-to-simulation and simulation-to-real applications. Later, **Franka** robotic arm will be used for experiments.
- Reimplement **Diffusion Policy** and **ALOHA** algorithms, deepening understanding of the application of imitation learning algorithms. Adjust the hardware configuration and interface of the **Franka** and **ARX** robot arm to realize the control of the robotic arm through LAN connection.
- Implemented the pre-trained model such as **Pi0** and **RDT** algorithms for **cross-embodied** manipulation research, explored generalization performance across heterogeneous robot platforms, and improved the capability to solve high-precision and long-horizon manipulation through designed fine-tuning.

Embodied Intelligence Algorithm Intern Jul 2024 – Sep 2024
MiLAB, Westlake University, Supv: Prof. Donglin Wang Hangzhou, China

- Systematically studied **autonomous driving vision perception** algorithms, **large language model**, and **ROS** communication protocols, contributing to the development of guiding functionality for quadruped robots.
- Implemented **Google Speech-to-Text** to convert voice commands into text. Combined **YOLOP** and **CLIP** models, using custom scripts to convert self-made datasets into the required format. **Fine-tune** the **MLLM** to ensure the system understood complex scenarios, achieving **detection, segmentation, and voice interaction** functionality.
- Gained expertise in developing and training robots using the **Gazebo** simulation platform and proficiently worked with the Ubuntu system. Successfully migrated **YOLOP** and **CLIP** models to a custom dataset and **fine-tune** technique, achieving a mean average precision (**mAP**) of 75%, Intersection over Union (**IoU**) of 70%, **Top-1 accuracy** of 72%, and **Top-5 accuracy** of 86%. The algorithm models are expected to be deployed on the **NVIDIA Jetson Xavier NX** computing module.

Other Experience

Intelligent cruise vehicle development project Jun 2023 – Aug 2023
(Third Prize of the 2023 National Embedded Chip and Design Competition)
Project Leader, Robotics LAB, University of Glasgow, Supv: Prof. Guodong Zhao Glasgow, UK

- Designed and implemented an autonomous driving system based on **OpenMV**, responsible for visual perception functions such as **line tracking, arrow recognition, traffic light detection, obstacle avoidance**, and **pedestrian detection** for an intelligent vehicle. The programming language used was **MicroPython**.
- Developed obstacle detection via OpenMV's IDE, enhancing accuracy through image binarization and optimizing motor control for obstacle avoidance. Integrated real-time image transmission with **SLAM** to construct a **3D obstacle map**.
- Enhanced expertise and practical proficiency in **visual perception** algorithms, fundamental **control systems**, and **SLAM-based map modeling** techniques.

Robotic Arm Team, UESTC Oct 2021 – Apr 2022
Team Leader Chengdu, China

- Led the team to complete the robotic arm goalkeeper project and participated in the university's innovation competition, winning the "Outstanding Team Design Project Award" (the highest award).
- Acquired proficiency in the manipulation and operation of robotic arm systems, with hands-on experience in implementing advanced control strategies. Gained expertise in Kalman filtering for sensor data fusion and trajectory estimation, as well as path planning algorithms for autonomous motion control.

Honers & Awards

- **2022-2023 School Scholarship (Top 20%)**
- **2023-2024 School Scholarship (Top 20%)**
- **2023-2024 Second Prize in the ACM College Competition**
- **2022-2023 Third Prize in the National Undergraduate Embedded System Design Competition**
- **IELTS 7.0 (Listening 8.5)**