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: 3.46/4.0

Coursework: Signal Processing, Artificial Intelligence, Analog Circuit, Digital Circuit, Dynamic Control

Research Experience

Multimodal multi-classification model based on binary classification network Jun 2023 – May 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. The related paper has been submitted to **IEEE Transactions on Image Processing (TIP)**.

Multi-classification task model based on noisy image training Jun 2024 – Present

Image Processing Lab, UESTC, Supv: Prof. Bing Zeng Chengdu, China

- Systematically studied and mastered knowledge related to machine learning, deep learning network models **(DNN, CNN, RNN)**, as well as image processing and image classification techniques.
- Research focuses on training models on **noisy image datasets** using robustness enhancing methods, aiming to improve accuracy (**ACC**) and Area Under the ROC Curve (**AUROC**) on both noiseless image test sets and open-set datasets.
- Reproduced the **OpenOOD** and **DnCNN** models, demonstrating the ability to debug most code and proficiently utilize Linux servers.

Project Experience

Perception system of quadruped guide robot 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 intelligent 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.

Intelligent cruise vehicle development project Dec 2021 – May 2022

(Third Prize of the 2023 National Undergraduate Embedded Chip and Design Competition)

Project Leader, Robotics LAB, Glasgow University, Supv: Prof. Guodong Zhao Glasgow, UK

- Designed and implemented an OpenMV-based autonomous driving system, handling line following, arrow and traffic light recognition, obstacle avoidance, and pedestrian detection, using Micro Python for real-time visual perception.
- Implemented obstacle detection and precise motor control using OpenMV, with image binarization for accuracy. Enabled real-time image transmission and 3D mapping with SLAM.
- Enhanced understanding and practical skills in visual perception algorithms, basic control algorithms, and SLAM-based mapping.

Honers & Awards

- **2022-2023 & 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)**