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 and visual perception** algorithms, utilized the **ROS** platform for communication and data transmission and implemented intelligent guide dog functionality for a quadruped robot.
- Reproduced the **YOLOP** algorithm and utilized the **YOLO-V8** framework. Developed custom scripts to convert a self-made dataset into the format required for the YOLOP model, facilitating future algorithm migration. Adjusted the model's network structure and training parameters to differentiate navigable areas for the quadruped robot, accomplishing **detection** and **segmentation** tasks.
- Proficient in using the **Gazebo** simulation platform for robot development and training, with strong skills in the Ubuntu system. Successfully adapted the YOLOP algorithm to a custom dataset, achieving a mean Average Precision (**mAP**) of **75%** and an Intersection over Union (**IoU**) of **70%**. The algorithm model is 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)**