Hongxiang Wang

Tel: +65 89429974 E-mail: hongxiang.wang@u.nus.edu

**Education Background**

**National University of Singapore** 08/2023-01/2025

**Degree:** Master of Computing

**Core courses :** Advanced Computer Architecture, Multi-Core Architecture, Distributed Systems, Parallel Computing

**Chongqing University ( Project 985 )**  09/2019-07/2023

**Degree:** Bachelor of Engineering (inElectronic Science and Technology)

GPA: 3.6/4.0 (Top 10%)

**Core courses: CMOS Integrated Circuits Design and Analysis, Semiconductor Physics, Verilog-HDL, FPGA Design Technology, Analog Electronics, Digital Electronics**

**Project Experience**

**Garbage-sorting Intelligent Automobile** 04/2021-08/2021

*National University Students' Opt-Sci-Tech Competition*

* Role: Team Leader
* Aimed to design a car to complete tasks of arriving at the designated location and quickly search, identify, sort and deliver five types of garbage to the designated landfills;
* Used a Kendryte K210 chip as the image sensor and an STM32F411CE MCU as the main controller of the car, and used a robotic arm for garbage sorting;
* Adopted Python, based on Tensorflow, to train the Yolo-tiny detection algorithm, and after completing the model training, quantified and deployed it on the K210 image sensor for target detection of five specified types of garbage;
* Transmitted the detected garbage category and orientation data to the car master STM32F411CE via UART protocol for data transmission and movement control, search, garbage sorting and delivery of the car;
* Won the Third Prize in Southwest Region.

**Design of An Intelligent Raster Map Measurement Tracking Car** 07/2021-08/2021

* Role: Team Leader
* Independently completed the circuit design;
* Used the STM32F103C8T6 as the main controller, ultrasonic distance-measuring sensor, infrared photoelectric switch and OLED display as peripherals;
* Programmed the line-following and obstacle avoidance algorithm based on C;
* Realized the function of displaying the coordinates of obstacles detected on the way in the form of a matrix on the OLED screen, driving automatically on the grid map, avoiding obstacles and drawing the grid map.

**Design of An Intelligent Car with Multiple Functions** 04/2022-08/2022

*National University Student Intelligent Car Race*

* Role: Team Leader
* Aimed to control the intelligent vehicle to track the lane autonomously and identify each element on the track to complete corresponding tasks such as reversing into the parking lot, raising flags, loading and unloading goods, etc.;
* Self-designed and built the intelligent vehicle circuit and related hardware structure;
* Programmed the lane segmentation and following code with Python, based on Baidu PaddlePaddle deep learning framework and Deeplabv3p semantic segmentation algorithm, integrated incorporating fuzzy PID control at the same time;
* Applied Yolo-Nano target detection algorithm for marker detection;
* Won the First Prize in the Deep Learning Group of the National University Student Intelligent Car Race and the Deep Learning Group of the Chongqing University Intelligent Vehicle Competition.

**MPU6050 Gyroscope Based Gesture Controlled Traffic Light Design** 06/2022-07/2022

* Role: Team Leader
* Implemented the remote control of traffic lights by human gestures using Bluetooth communication;
* Responsible for system design, algorithm design and hardware debugging.

**Google Universal Image Embedding Competition** 09/2022-10/2022

* Role: Team Member
* Aimed to build a generic image embedding model that is capable of representing objects from multiple domains at the instance level;
* Engaged in data collection and preprocessing, model modification and training, using CLIP as backbone;
* Ranked top 4%, 31st of 1022 teams, won the Silver Medal.

**Design of Bandgap reference** 09/2022-10/2022

* Role: Personal Course Design
* Using Cadence Virtuoso, Calibre, Cadence Spectre and other software to complete the circuit schematic diagram drawing and simulation, layout design and verification, netlist parameters extraction, and finally completed the circuit before and after simulation to verify the layout design to meet the requirements and export GDSII files.
* The stable output of the band-gap voltage VREF is about 1.23V, where the error is less than 0.159mV in the range of 2.5 ~ 6V, and the error is 4.706mV in the range of -25℃ ~ 125℃, which meets the design standard.

**Internship**

**Business-intelligence of Oriental Nations Co., Ltd.**  04/2021-06/2021

* Position: Computer Vision Intern
* Completed the Photovoltaic Cell Surface Defect Detection project;
* Produced a standard dataset by cleaning and annotating Photovoltaic cell surface image data with a size of about 10000 pieces;
* Using Python, Constructed the target detection model based on Pytorch deep learning framework and Yolo-v5 target detection algorithm;
* The final trained model can output the defect category and the coordinates of the defect location for PV cell images with an accuracy of over 85%.

**Extracurricular Activities**

Organized class winter vacation review punch card activity

Participated in the 29th Student Representative Assembly as representative of the School of Opto-electronic Eng

Volunteered in the Chongqing anti-flood rescue activities

Volunteered in teaching activities in remote mountainous areas

**Honors & Awards**

Second-class Scholarship in the 2nd semester of the 2019-2020 academic year 12/2020

Second-class Scholarship in the 1st semester of the 2020-2021 academic year 05/2021

Second Prize in National University Students' Artificial Intelligence Knowledge Competition 06/2021

Third Prize in 9th National University Students' Opt-Sci-Tech Competition 18/08/2021

Excellent Student Cadre of Chongqing University in the 2020-2021 academic year 12/2021

Second-class Scholarship in the 2nd semester of the 2020-2021 academic year 12/2021

Third-class Scholarship in the 1st semester of the 2021-2022 academic year 05/2022

First Prize in the Chongqing University Intelligent Vehicle Competition 08/06/2022

First Prize in the 17th National University Students Intelligent Car Competition 08/2022

Second-class Scholarship in the 2nd semester of the 2021-2022 academic year 10/2022

Silver Medal in the Google Universal Image Embedding Competition (Ranking top 4%) 10/2022

Outstanding Graduate of Chongqing University in the 2021-2022 academic year 11/2022

**Professional Skills**

Programming Languages: C/C++, Python, Java, Verilog-HDL, System Verilog

Framework and tools: Pytorch, Tensorflow, Keras, Linux, Git, Makefile, Cmake

EDA Tools: Vivado, DC Compiler, Spyglass

Circuit Design: Quartus II, Cadence Virtuoso, Cadence Spectre, Altium Designer