



# HUANG, Lok Hin

黄乐轩

## LOCATION

Hong Kong · Shenzhen

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## GITHUB

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## WECHAT

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## PORTFOLIO

wilson-portfolio-436.pages.dev

## SKILLS

C/C++ ARM Cortex-M

STM32/GD32 FreeRTOS

CAN/FDCAN UART/SPI/I2C/Modbus

DMA/Interrupts

Motor/Actuator Control PID

State Machines Kinematics/Dynamics

Python KiCad Schematics

Oscilloscope Logic Analyzer

SystemView Tracealyzer Git

## LANGUAGES

Mandarin · Cantonese · English (Fluent)

## EDUCATION

### Hong Kong University of Science and Technology (HKUST)

2023.09 - 2027 (Expected)

BEng in Computer Engineering · Minor in Robotics · Extended Major in Artificial Intelligence

System Modeling, Analysis and Control Machine Learning Embedded Systems Robotics Design and Analysis of Algorithms

## INTERNSHIP EXPERIENCE

### Shenzhen WildNovate Technology Co., Ltd.

2026.06 - Present

Embedded Systems Intern

- Develop motor and actuator communication drivers for outdoor intelligent vehicles. Built control links on **GD32F470/GD32H737 + FreeRTOS** using **UART/RS485, CAN, and PWM/PPM** to provide reliable communication between the main controller and propulsion, steering, and lifting mechanisms.
- For communication faults, actuator disconnections, power-supply fluctuations, and adverse operating conditions, designed **timeout detection, error recovery, status reporting, and safety protection**; used **oscilloscopes and logic analyzers** to verify communication timing and stability.
- Developed **basic motion control for translation and rotation** from kinematic and dynamic models, and participated in system integration.

GD32F470/H737 UART/RS485 CAN PWM/PPM Kinematics/Dynamics Hardware Debugging

## PROJECT EXPERIENCE

### RoboMaster Engineer Robot - 6-Axis Manipulator on Mobile Chassis

2024.10 - 2025.08

Competition · Role: Embedded Control

- For complex field tasks including **ore pickup, storage, exchange, stair climbing, and rescue-robot interaction**, completed **three-node embedded system integration** of a 6-axis arm gimbal, swerve chassis, and custom isomorphic controller on STM32G473/G431 + FreeRTOS, with multi-actuator scheduling, FDCAN inter-board communication, and a full-robot state machine.
- Improved full-robot stability for continuous field tasks, achieving an **approximately 90% ore storage and retrieval success rate** with no chassis rollover during tasks; stabilized the main gimbal to enable **spin-to-mine ore pickup**.
- The robot **ranked among the top performers** in exchange efficiency and high-difficulty task completion, set the **5.8 s record for the fastest Level-4 ore exchange**, and was selected for the RoboMaster 2025 All-Star Game.

STM32G473/G431 FDCAN 6-Axis Manipulator Swerve Chassis Stabilized Gimbal Force Feedback

### RoboMaster Embedded Core Library

2024.08 - 2025.08

Competition · Role: Embedded Department Leader

- Led an **approximately 10-member embedded team** maintaining the RM2025-Core driver/middleware platform. Unified interfaces for CAN/FDCAN, motor drivers, IMUs, the referee system, inter-board/ROS communication, and control/math utilities, supporting **reuse across all 7 team robots**.
- Owned feature development, urgent bug fixes, and PR reviews; used **SystemView and Tracealyzer** for real-time task diagnostics and reliability maintenance.
- Delegated power-control, motor-driver, serial-protocol, and DSP/matrix-library subprojects, and designed and delivered **approximately 10 onboarding sessions**.

Drivers/Middleware Cross-Robot Platform SystemView Tracealyzer Code Review Team Leadership

### Swerve Chassis & Open-Source Power Control Algorithm

2024.05 - 2024.08

Competition / Open Source · Role: Embedded Control, Algorithms

- Addressed **steering zero-offset drift and abrupt target-speed changes** with a **ChassisCalculator solver and speed-limiting strategy**, enabling stable Engineer chassis motion control and reuse across Hero, Engineer, Infantry, and Sentry chassis.
- Used RLS for **1000 Hz online motor power-model identification** and designed power/energy loops with supercapacitor management. Supported mecanum, omni, swerve, and wheel-legged chassis, achieving **zero health deductions caused by power-limit violations** throughout the season; open-sourced on [GitHub](#) / [RM Forum](#).
- Added **referee-system/supercapacitor disconnection handling** to prevent invalid data from corrupting the online identification model.

RLS 1000Hz Power/Energy Control Fault Handling Cross-Chassis Reuse Open Source

### 4-Axis Exoskeleton Arm

2025.11 - 2025.12

Course Project · Role: Embedded Control, Algorithms

- Completed proposal, simulation and early prototype validation, component selection, forward development, system integration, and **final demo delivery in just over one month** against course milestones.
- Developed a 4-axis exoskeleton arm on STM32H750 + FreeRTOS, integrating **four J4340 joint motors in MIT mode and a wrist IMU**, joint-state updates, and real-time torque output.
- Built **DH chain, Jacobian, and RNEA inverse-dynamics models** for gravity/inertia compensation and endpoint virtual-force mapping; verified the system using MATLAB modeling and friction-fitting scripts.

STM32H750 RNEA/Jacobian MIT Control IMU Milestone Delivery

More project experience: [wilson-portfolio-436.pages.dev](#)

## HONORS

- 2025.08** - RoboMaster 2025 University Championship Revival Tournament, Second Prize
- 2025.04** - RoboMaster 2025 University League Zhejiang Regional, Champion
- 2024.08** - RoboMaster 2024 University Championship Revival Tournament, Second Prize
- 2024.04** - RoboMaster 2024 University League Guangdong Regional, First Prize
- 2026.06** - HKSAR Government Talent Development Scholarship (TDS), 2025/26
- 2025.07** - HKSAR Government Talent Development Scholarship (TDS), 2024/25

## SELF EVALUATION

HKUST Computer Engineering undergraduate (expected 2027), focused on embedded systems and robotics control, with experience in STM32/GD32, FreeRTOS, communication drivers, multi-actuator control, and hardware-software integration. Through my embedded internship, I have gained full product development lifecycle and mass-production experience while conducting production-grade driver-module stability testing, fault handling, and safety assurance design. Previously led an approximately 10-member RoboMaster embedded team and maintained a Core platform shared by 7 robots.