Zhuohang Wu (John Wu)

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Technical Expertise

Embedded Systems and Control, Robotics and AI, Internet of Things

Education Background

MSc in Systems Engineering for the IoT, UCL, UK Sep, 2024 - Sep, 2025

BSc in Automation (EEE), Northeastern University, China, **Twice** Scholarship Sep, 2021 - Aug, 2024

Team Projects

Collaborative Control for a Quadrotor with a Robotic Arm Ongoing

With MPPI whole-body control strategy, integrating dynamics for aerial manipulation tasks.

Thames River Coliform detection IoT AI system via inorganic sensors Ongoing

Significantly faster and more cost-effective compared to traditional organic methods.

A multi-agent navigation system in simulation and real world. Dec 2024

Optimized control strategies, addressed challenges in simulation-to-reality mapping.

Bachelor Project: Novel Electromechanical Switch Design and Application in Robotic Arms. Aug 2024

Based on robotic kinematics. Won **Outstanding Graduation Project.** And ***Publication1.***

Hand-hold Control Box for ***SIASUN*** Robotic Arm during Internship. Jun 2024

Peripheral chips and devices drivers, Firmware development and debugging.

Wireless Controlled Omnidirectional Mobile Platform while Intern in ***ISOM***. Jul 2022

Closed-loop speed & position control, anti-slip acc & deceleration

Two wireless controller via 1.**LoRa**, 2.Wi-Fi with **HTTP**. Applied ***Patent1.***

Electromagnetic Testing Device for Oil and Gas Pipelines. Apr 2021

Designed **embedded system** including electromagnetic testing PCB and **software**.

Won **Gold Award** in the "Internet+" Competition of Liaoning Province. Granted ***Patent2.***

DJI RoboMaster International Robotics Competition, dominating the major Hero Robot. Jan 2021

University: As team **leader** and won First Prize, 250% faster than the 2nd group.

Northern China: As electronic control group **leader**, won **First Prize**. And ***Publication2.***

Focus on **embedded firmware**, **control strategy**, **MQTT**, I2C, CAN, leading group work.

Internship Experience

SIASUN Robot & Automation Co., Ltd 15.Apr.2024 - 17.Aug.2024

R&D of robotic arms control box, met control communication and UI display requirements.

Supcon Technology Co., Ltd. 07.Jul.2022 - 11.Aug.2022

Installed and debugged 2 sets of intelligent traffic terminals.

ISOM of China (Hangzhou) Co., Ltd. 02.Jun.2022 - 06.Jul.2022

R&D of **AGV** robots, implementing the chassis control subsystem.

Senyuan Road & Bridge Co., Ltd., 01.Jul.2020 - 20.Jul.2020:

Developed an adjustable DC backup supply. Granted ***Patent3.***

Zhejiang Lab brain-inspired chip Dep:

Studied Darwin chip which supports spiking neural networks.

Practical Skills

Embedded Systems

Proficient in ARM MCUs and **Keil**, including **STM32F1xx** and F4xx, Arduino, Ras-pi, ESP32.
Proficient in **USART, SPI, I2C,8080, and CAN** protocols, register level debugging experience.
Skilled in GitHub, adjust and design **PID** controllers in motor speed and position, **RTOS**.
Temperature and liquid level control, **Smith predictor** design and adjusting.

Hardware Design

Circuit design with **Altium Designer**; PCB soldering and assembly; modelling with **Solidworks**
Based on datasheet to develop drivers and peripheral circuits.

Machine Learning: Random forest, PCA, CNN, Gaussian process, Bayesian Optimization, OpenCV, etc.
Programming Languages: C/C++, Python, MATLAB, JavaScript, HTML.
Language Proficiency: Native **Mandarin** speaker; **TOEFL**: 104/120, CET-4: 559/710, CET-6: 508/710.

Personal Interest Projects

Fixed-Wing Flight Control System

GPS, OLED, wireless, gyro attitude estimation and stabilization, auto-return, waypoint navigation

PLC-Based Vision Sorting System

A CV based robotic arm sorting system, controlled via PLC to sort and transport efficiently.

Courtyard Solar Self-Sufficient Power System

Network camera, IoT, **MPPT**, DC-AC inverter, **SPWM**, Li-ion battery BMS.

Smart Toilet System Design

Smith temperature control, multi-level menu design, multi-threaded design.

Hardware signal generator

Pure hardware to generate sin, square, triangular, and sawtooth with adjustable freq and Vpp

STM32 Oscilloscope using **FFT**

Other Achievements

As **Leader**, won the National level Undergrad Innovation Training Program on "Design and Development of Smart Video Surveillance Holographic Digital Twin System" in June 2022.

Co-leader of the Intelligent Car Lab in the TI Cup Competition in October 2022.
Represented Northeastern University in the **TI Cup National Competition** in August 2023.

Patents and Publications

Publication1: "Novel Electromechanical Switch Design and Application in Robotic Arms" (Archived in University Library as Outstanding Graduation Project, First Author, 2024)

Patent1: Method to Correct Motor Speed Measurement Error First Inventor, Substantive Exam 2023)

Publication2: "Mechanical Design and Wheel-Leg-Body Cooperation Control of a Step-Climbing Robot" (*Journal of Field Robotics*, 2022)

Patent2: Magnetic Flux Leakage Detect Device with Switchable Excitation Direction (2021)

Patent3: Speed Measurement Device and Method for Vehicles (First Inventor, 2020)

GitHub Link

https://github.com/Headmaster218?tab=repositories