Yueqiao Wang

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**Seeking a role to apply skills in microcontroller firmware, real-time control, and robotics.   
Offering hands-on experience in C/C++, embedded programming, hardware-software co-design, team leadership in tech projects, and communication with Non-Tech Clients.**

**Education**

Bachelor of Science, Computer Engineering 05/2026

**Rose-Hulman Institute of Technology | Terre Haute, IN GPA:3.28/4.00**

* Honors: RHIT Dean’s List, Rose-Hulman Merit Scholarship
* Minor: Computer Science & Economics (in progress)
* Certificate: Semiconductor Materials and Devices (in progress)
* Related Courses: Signal Processing; Continuous-Time Signals & Systems; DC & AC Circuits; Circuit System; Electronic Device Modeling; Digital System; High-Speed Digital Design; Control System; Embedded Systems; Operating Systems; Communication Networks; Object-Oriented Software Development; Competitive Programming; Data Structures & Algorithm Analysis; Parallel Computing; Web Development; Computer Architecture I & II & III; High Performance Computing & AI; Semiconductor Physics; Product Design; Technical Communication

**Skills**

**Language**: Native Chinese, Professional English

**Programming & System**: Assembly, Verilog, bash, shell, linker script, C, C++, CMake, GCC, Java, Python, HTML, JavaScript, CSS, MATLAB & Simulink, Unix System Operation, Linux, Debian, Ubuntu, MacOS

**Software Development**: Git, GitHub, GitHub Action, GitLab, Docker, Agile & Test-Driven Development

**General Hardware**: Finite State Machines (FSM), FPGA, Quartus Prime, ModelSim Simulation; Instrumentation, Power Supply & Load Programming, Oscilloscope, Multimeter, Function Generator

**Computer Architecture**: Micro Architecture,Instruction Set Architecture, Performance Metrics, Roofline Analysis

**Embedded System:** Microcontrollers Config & Programming, Embedded C Development, Interrupt Handling, Timer-Based Scheduling, Real-Time Event Control, Sensor and Actuator Integration, Analog Digital Conversion, UART, I2C, SPI, Wireless Communication, Debugging & Verification, Low-Power Embedded Design, Robotics Integration

**Digital Design**: Cadence OrCAD & PSpice, Component Selection, PCB Layout & Fabrication & Testing, High-Speed Digital Signal Transmission, Transmission Line Analysis, Impedance Matching, Crosstalk Mitigation, Power Integrity

**Networking**: TCP/IP, OSI Model, Signal Encoding, Error Detection, ARQ Protocols, Sliding Window Protocols, Network Switching & Routing, Multiplexing, Subnetting, Ethernet, Wireless Networks, Medium Access Control (MAC)

**Operating System:** Kernel-Level Programming & Debug, Multi-Thread/Process Programming, System Call, Memory

**AI & Machine Learning:** Transformer-Based Neural Networks (TNN), Attention Mechanisms, Multilayer Perceptron, AI Model Training & Inference, Running AI Workloads on HPC Systems

**AI Application**: Integrating AI into software solutions, local model deployment, and optimization

**System Engineering:** System Validation & Verification, Unit Test, Functional Architecture Modeling, Agile & Test-Driven Development

**Engineering Design & Ethics:** System Design Process, Open-Ended Project Management, Team Collaboration & Conflict Management, Stakeholder-Requirement Analysis, Technical Report Writing & Poster Presentation, Ethical Decision Making in Engineering

**Other**: Data Analysis, Problem-Solving and Analytical Skills, SolidWorks, 3D Modeling, 3D Printing & 3D Printer Repair, Group Work, Teamwork, Adaptability

**Research Experiences**

**MorpheOS: Teaching-Focused RISC-V Microkernel, Operating System 06/2025 – Present***Rose-Hulman Institute of Technology, Terre Haute, IN*

* Designed and implemented core microkernel components (boot process, board bring-up, trap/exception handling, timer-driven preemption, and PLIC-based external interrupts) on a RISC-V SoC platform; Integrated OpenSBI (FW\_DYNAMIC) and verified the system on QEMU with GDB; Authored extensive documentation, lab exercises, and code comments to support an educational OS stack; Maintained reproducible build tooling (Makefiles, scripts) for student use; Collaborated remotely under faculty mentorship
* Practiced low-level debugging and development skills (RISC-V assembly, QEMU, OpenSBI, GDB, linker scripts, interrupt controller configuration) while contributing to a teaching-focused open-source project
* Researched & Designed memory and page table layout, Hypervisors Potential, and context switch speed-up method

**Researcher Manager, Open-Source Educational Robotics, Robotics,** [***LINK***](https://merl-rose-hulman.github.io/) **05/2024–Present***Rose-Hulman Institute of Technology, Terre Haute, IN*

* Designed and programmed human-interactive robot frameworks using various microcontrollers (Arduino, Raspberry Pi, etc.); Implemented software architectures using C, JavaScript, and Python; Used Cadence OrCAD for Printed Circuit Board design; Designed 3D models and mechanical components in SolidWorks
* Elevated team throughput by introducing a Git branching model, an online TODO tracker, a shared team calendar, and an internal wiki system; Mentored 5 new student researchers in a multidisciplinary team under faculty supervision, improving onboarding time by 20%
* Built end-to-end embedded systems (circuit design & soldering, HW–SW integration, product design); Deepened proficiency with microcontroller, embedded C programming, CAD workflows, and technical documentation through iterative development cycles

**Processing-In-Memory DPU Scaling Analysis, Computer Architecture 11/2024 – 03/2025**

* Conducted simulation and analysis on Data Processing Unit (DPU) configurations in UPMEM Processing-In-Memory (PIM) systems; Simulated various DPU scaling configurations using uPIMulator; Evaluated performance metrics from benchmark simulation results, such as execution latency, throughput, and memory bandwidth utilization
* Automated batch simulations & data reduction with Bash/Python, producing reproducible configs and CSV summaries [4 configs × 6 runs]; Documented trade-offs and configuration guidelines for computational-memory systems
* Explored Gem5, Ramulator, ZSim, uPIMulator, and other simulation tools; Gained hands-on experience in computer architecture research, experimentation, and performance modeling; Applied Linux/Unix-based system command line operation

**Project Experiences**

**OAO Autonomous Vehicle Firmware, Embedded Systems & Controls 03/2025 – 05/2025**

* Developed modular firmware in C++ for an ESP32-based autonomous vehicle; Implemented a RUN/STOP/PIT-STOP state machine aligned with object-oriented design principles; Integrated PID steering control and proportional speed throttle; Incorporated HuskyLens vision for line tracking, INA219 sensor for power monitoring, and PWM drivers for motors/servos; Built an on-device Wi-Fi dashboard using ESPAsyncWebServer (with WebSocket and LittleFS) to provide real-time telemetry, parameter tuning, and CSV data export
* Served as software lead in a 4-person team (2 software, 2 hardware); Owned development of firmware, controls logic, and serial/Bluetooth/web UI integration; Partnered with hardware team members on circuit integration, wiring validation, and bench testing
* Practiced ESP32 C++ modular design, finite state machines (RUN/STOP/PIT-STOP), PID tuning, sensor I/O (HuskyLens, INA219 via I²C), PWM motor/servo control, Wi-Fi telemetry & WebSocket UI (ESPAsyncWebServer, LittleFS), serial/BLE communications, CSV logging, test planning & bench validation, circuit/wiring integration, and Git-based workflow (branching, code reviews)

**Socket Chat Program, Network Programming 09/2024 – 11/2024**

* Developed an IP-based two-person chat application using TCP sockets in C; Implemented custom network protocols over UDP (with additional messaging features over UDP)
* Collaborated in a 2-person team, splitting the workload 50/50; Took primary responsibility for designing and implementing a custom, reliable UDP messaging protocol on top of sockets, ensuring message ordering and integrity
* Strengthened skills in Networking Protocol, low-level network programming (sockets API), protocol design, and error handling in C; Improved debugging techniques, packet capturing for networked systems; Honed teamwork through pair programming and testing

**LazyPlant, Embedded System,** [***LINK***](https://github.com/WillWYQ/LazyPlant) **11/2023 – 03/2024**

* Created an automated plant care system with embedded C software on a TI MSP432 microcontroller; Optimized plant conditions through water pump, grow light, and fan control based on soil moisture, light, and temperature monitoring, and configurable profiles; Developed drivers for sensors and NeoPixel LED; Utilized interrupt routing, ADC sensor
* Led a team of two as the main designer and software contributor; Collaborated effectively to integrate mechanical and hardware components and enhance system performance
* Practiced embedded system firmware development, low-power mode control, data protocol (SPI, UART, I2C), and real-time clock scheduling; Improved skills in embedded system design, hardware automation, and hardware debugging (Oscilloscope and other equipment), as well as project leadership and documentation

**Leadership & Teaching Experience**

**Marker Lab – Archivist 03/2023 – Present**

**International Student Association – Treasurer 03/2023 – 06/2025**

**Embedded Systems Development – Teaching Assistant 11/2024 – 03/2025**

**Direct Current Circuits – Lab Assistant 03/2024 – 05/2024**

**Object-Oriented Software Development – Teaching Assistant 09/2023 – 11/2023**