Yueqiao Wang

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**Embedded/Firmware/Robotics**

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

**Architecture/HPC Track**

**Seeking to contribute to Computer architecture or high-performance computing projects. Bringing experience with architecture-level simulation, hardware/software co-design, and performance optimization techniques.**

**Platform Software Developer / Systems Engineer**

**Seeking opportunities to develop and optimize low-level system software (operating systems, drivers, networking). Combining strong academic fundamentals in OS and architecture with hands-on project experience in kernel development and system programming**

**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; Embedded Systems; Operating Systems; Communication Networks; Object-Oriented Software Development; Competitive Programming; Data Structures & Algorithm Analysis; Web Development; Computer Architecture I & II; Advanced Computer Architecture; High Performance Computing & AI; Principles of 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, 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**: Verilog, Micro Architecture,Instruction Set Architecture, Silicon Platforms, RTL Simulation, Cycle-Accurate Simulators, Gem5, Ramulator, ZSim, uPIMulator; Performance & Power Analysis; Research & Experimental Design

**High-Performance Computing:** Performance Metrics, Roofline Analysis, Analytical Modeling, HPC Profiling, Omniperf

**Parallel Computing**: Multi-GPU Processing, Matrix-Fused Multiply Accumulate (MFMA)

**Embedded System:** Microcontrollers, Microcontroller Programming, Embedded C Development, Interrupt Handling, Timer-Based Scheduling, Real-Time Event Control, Sensor and Actuator Integration, Analog Digital Conversion (ADC & DAC), Serial Communication (UART, I2C, SPI), Wireless Communication (RF, Bluetooth, BLE, Wi-Fi), Debugging & Verification, Low-Power Embedded Design, Robotics

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

**Signals & Systems:** Fourier Series & Transform, Frequency Domain Analysis, Filter Design, Feedback Control Systems, Z-Transform & Discrete-Time Systems, Digital Signal Processing Implementation

**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, Interrupt, Process Creation & Scheduling, Memory Virtualization, Virtual Memory Management, File System, Concurrency & Synchronization, Low-Level System Security & Access Control

**Server**: Apache, Nginx, Linux, IT Service Management, Web Hosting, NextCloud, Composer, AWS, GCP, Azure

**Databases**: MySQL, MariaDB, MongoDB, Firebase Realtime Database

**Web Development:** User Experience (UX) & Design, Prototyping with Figma; Front-End Development with HTML, CSS, JavaScript, Vue.js, React, UI Component Bootstrap; Client-Side Frameworks & Libraries; Server-Side Development with Node.js, Express.js, Firebase, WordPress; Authentication & Security with OAuth, SSL/TLS, Web Sockets; REST API Development & Integration; Asynchronous Programming with Callbacks, Promises, and Async/Await; Cloud Deployment & Hosting, AWS, Google, Local Server, Virtual Private Server, React

**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, System Verification, Subsystem Verification, Unit Test, Functional Architecture Modeling, Test-Driven Development, Agile 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

**Project Experiences**

**Performance Metrics & Optimizer Study, HPC 04/2025 – 05/2025**

* Built a reproducible performance-metrics pipeline to profile matrix- and memory-intensive workloads; Implemented MATLAB/Python search script to find near-optimal configurations under power/cost constraints (grid + heuristic local search); Produced comparison reports based on throughput/latency/energy to guide design decisions
* Worked in a team of 2; Focused on High-Performance Computing (HPC) performance profiling and script creation; Increased the search efficiency by over 100% from hand calculation
* Delivered our design to the class and professor; Authored post-mortem and teaching notes that dissected modeling, scaling limits, and “memory-wall” sensitivity; Strengthened skills in profiling, metric design, optimization algorithms, and experiment reproducibility; Familiar with real-world HPC tasks operation, Unix System operation through AMD HPC cluster

**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

**Model United Nations App, Web/APP Development 08/2024 – 10/2024**

* Developed a Model United Nations Management app as a WeChat Mini Program application using Vue.js (front-end) and WeChat’s cloud functions as back-end, to streamline event sign-up and management for a Model United Nations conference (CYMUNC); Improved event registration efficiency by ~50% for over 200 users by moving from manual registration to the app-based system; Implemented features for delegate sign-up, scheduling, and real-time announcements which enhanced the experience for both organizers and participants
* Served as the sole software developer in a 4-member organizing team in a cross-time zone setting; Worked closely with the event’s Art Chair, HR, and the Director; Communicated technical concepts in simple terms to non-technical team members and gathered continuous feedback to refine the application
* Enhanced skills in JavaScript (Vue framework), cloud function scripting, and database management; Demonstrated the ability to bridge technical and non-technical domains by translating user requirements into effective software solutions

**ParkSmart App, Web Development,** [***LINK***](https://github.com/WillWYQ/ParkSmart) **07/2024 – 10/2024**

* Engineered a mobile-friendly campus parking availability app using JavaScript, HTML/CSS, and Google Firebase for real-time database/backend; Enabled users to report available parking spots and access live parking data on campus, improving parking information accessibility
* Sole developer in this project: designed the UI/UX, implemented front-end and back-end logic, and integrated feedback from non-technical campus stakeholders; Communicated with campus management to gather requirements and iterate on features
* Enhanced full-stack development skills and UI design and mock proficiency; Familiarized with the software development process; Gained experience in requirement analysis and stakeholder communication

**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 driver for sensors and NeoPixel LED; Utilized interrupt routing, ADC sensor reading
* 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

**Lime RISC-V Instruction Set, Computer Architecture 11/2023 – 03/2024**

* Designed and implemented a simplified multi-cycle RISC-V-like Instruction Set Architecture; Focused on Branch-Type Instructions, Control Unit Design, Verilog Implementation, Testing, Benchmark, and Compiler; Validated the correctness and performance of the ISA at the assembly and memory level through ModelSim simulation
* Collaborated with other 3 teammates, designed data path together, divided responsibilities across subsystems, memory, Instruction Register, Immediate Generator, Arithmetic Logic Unit, and Control unit; Conducted regular integration sessions to ensure smooth interfacing between components and to resolve system-wide issues early
* Enhanced understanding of Assembly Language, Register-Transfer Level design; Practiced hardware description in Verilog and simulation using ModelSim, gaining insight into pipeline vs. multi-cycle trade-offs and computer architecture fundamentals

**EV Battery Pack Testing Software, Hardware Automation, 09/2023 – 09/2024**

* Engineered an Automated Cell Testing Program that controls power supply and load and collects data automatically by using MATLAB, Simulink, Python, PyVISA, and Raspberry Pi, which significantly improved the team's testing efficiency by 30%
* Collaborated closely with the other teams and worked with software sub-team team members to implement cell testing procedures, enhanced teamwork and project outcomes
* Collaborated closely with cross-functional sub-teams in the battery workshop challenge; Worked within the software sub-team to implement consistent testing procedures and data logging formats, which improved data reliability and team efficiency
* Boosted skills in hardware-software integration and lab automation; Gained experience in instrument control protocols, automated data collection, and register-level programming for device interfacing; Contributed to reduced manual effort and increased data accuracy for the project

**Guitar Hero Arcade Game, Digital Design and FPGA 03/2023 – 05/2023**

* Designed and implemented a Guitar Hero-style rhythm game on an Altera DE2 FPGA board. Developed the game logic in Verilog, including combinational and sequential logic for note timing and a state machine for game flow
* Led a team of 2 in planning the game features and dividing development tasks. Coordinated design strategies, managed integration of modules, and maintained effective communication using shared to-do lists and schedules
* Mastered FPGA development workflow and Verilog programming; Gained experience in complex digital logic implementation and real-time state-machine design, while also building collaborative project management skills

**Genetic Algorithm Evolution Simulator, Software Engineering 11/2022 – 03/2023**

* Developed a Java-based genetic algorithm simulator with a graphical user interface to visualize evolutionary processes in real time; Implemented selection, crossover, and mutation operations to evolve solutions to a given problem, and provided a visualization of population changes over generations
* Collaborated with one teammate on design and integration; Jointly designed the overall class structure and algorithm flow; Individually implemented key classes and features; Held regular meetings to integrate components and ensure cohesive functionality, which significantly improved project consistency and on-time delivery
* Strengthened object-oriented programming skills and learned to handle concurrency for parallel fitness evaluations; Improved proficiency in Java GUI development and applied problem-solving techniques (including exception handling and UML design) to refine the simulator’s robustness

**• WIC Personal Website & Collaboration Suite, Web/IT 2019 – Present**

* Established and managed a WordPress-based personal website for a student community, along with an integrated NextCloud file sharing server, email system, and other collaborative tools; Created a secure, centralized platform for team collaboration and efficient resource sharing
* Utilized online resources and forums to troubleshoot server issues and optimize performance (Apache, PHP, MySQL, Memcached); Implemented security measures (SSL/TLS certificates, access controls) that significantly enhanced website reliability and data safety
* Gained practical experience in VPS administration and web infrastructure management (Linux server configuration, database management, web hosting); Strengthened skills in web security and full-stack maintenance, covering technologies like Debian/Ubuntu, Apache/Nginx, PHP, MySQL/MariaDB, and Node.js

**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
* Researching & Designing memory and page table layout, Hypervisors Potential, and context switch speed-up method

**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 (1–16 DPUs per rank) using uPIMulator, a cycle-accurate simulator; 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

**Leadership & Teaching Experience**

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

Curated and maintained an organized repository of project materials and equipment in the campus makerspace; Supported student project teams in locating resources

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

Managed budgeting and finances for a student association of 50+ members; Organized funding for cultural events and improved transparency in financial reporting

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

*Rose-Hulman Institute of Technology, Terre Haute, IN*

Assisted in instructing an Embedded Systems lab course: helped students debug C/assembly code on microcontrollers, graded assignments, and reinforced best practices in embedded programming

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

*Rose-Hulman Institute of Technology, Terre Haute, IN*

Provided hands-on support to students in an electrical circuits lab; Ensured safe operation of equipment and understanding of circuit theory through demonstrations

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

*Rose-Hulman Institute of Technology, Terre Haute, IN*

Tutored students in Java OOP concepts and design patterns; Facilitated lab sessions and assisted the professor in evaluating student projects