

# Shaochen “Gavin” Ma

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## Objective

Seeking a full-time Embedded Software Engineer position to apply expertise in C++, Python, and real-time control system design, with hands-on experience in motor control, battery modeling, and embedded systems to develop robust hardware-software integrated solutions

## Education

**Georgia Institute of Technology** **Aug 2024 – Dec 2025**

MS in Electrical and Computer Engineering | **GPA: 4.0 / 4.0**

- *Relevant Courses:* OpenCV, OpenGL, AI/ML, ROS2, Multithreading, Electric Vehicle, Wireless Network

**University of California, Irvine** **Sep 2020 – Jun 2024**

BS in Computer Science and Engineering | **GPA: 3.731 / 4.0**

- *Relevant Courses:* Embedded System, Computer Network, Computer Architecture, Semiconductor

## Technical Skills

Programming & Tool: C++, C, Python, Java, Git, Linux, EAGLE, Vim, VHDL, Verilog, Matlab, Microsoft Office  
Technologies & Protocols: Bare-Metal Programming, RTOS, HIL Test, UART, I2C, SPI, GPIO, PWM, TCP/IP, UDP

## Experiences

**WeKruit LLC** | *Software Engineer Intern* **May 2025 – Aug 2025**

- Implemented a gaze tracking module with dlib landmarks and REMoDNaV classification, delivering real time overlays and heatmaps, surfacing eye contact and attention metrics
- Developed an intelligent interview analysis platform using React and TypeScript, designing modular components and implementing RESTful data flow for responsive user interaction
- Integrated facial expression and voice tone analysis models via API, enabling real-time, multi-dimensional candidate evaluations and enhancing decision-making efficiency

**Real-Time Embedded Control on Tiva C Microcontroller** | *System Developer & Leader* **Jan 2024 – July 2025**

- Designed a DRL/brake light system simulating automotive behavior: used interrupts and RC filters to control LED brightness logic (idle low-brightness, flashing on brake, then high-brightness steady-on)
- Built real-time systems including an LED controller, keypad/LCD calculator, PWM dimmer, and tone playback with integrated LCD, keypad, potentiometer, EEPROM, and speaker using interrupt-driven and timer-based scheduling on the TIVA TM4C123GH6PM microcontroller
- Integrated external peripherals (LCD, keypad, potentiometer, and speaker), and implemented interrupt-driven event handling and timer-based scheduling to ensure real-time system responsiveness

**Electric Vehicle Simulation and Control Projects** | *System Developer* **Aug 2024 – Dec 2024**

- Simulated real-time embedded control scenarios for Hybrid Electric Vehicles (HEVs) by modeling parallel dynamics, battery cycling, and power electronics in MATLAB/Simulink
- Designed and implemented RC-based battery circuit models for SOC (State of Charge) estimation, achieving ~96.6% round-trip energy efficiency
- Implemented Permanent Magnet Synchronous Motor (PMSM) drive control using sine-triangle PWM and third-harmonic injection; applied dq-axis control theory to reduce torque ripple and improve performance
- Built and compared EV charger models with and without Power Factor Correction (PFC), analyzing Total Harmonic Distortion (THD), charging time, and waveform distortion to evaluate power quality and system behavior

**Autonomous Rover with Multi-Sensor Fusion and Object Detection** | *Engineer* **Oct 2023 – Mar 2024**

- Built an autonomous rover using Jetson Nano Orin, Pixhawk, and ROS; integrated GPS, RPLiDAR, and depth cameras for real-time perception and control
- Preprocessed RPLiDAR data to construct a 3D environment fused with camera depth frames; applied semantic segmentation as an additional criterion for obstacle avoidance
- Developed real-time path planning and waypoint navigation modules, achieving 75% outdoor accuracy
- Integrated MAVLink telemetry and implemented communication over UART, I2C, TCP, and IEEE 802.11 for sensor and system coordination

**EdgeDevice AI LLC** | *Machine Learning Engineer Intern* **Aug 2022 – Sep 2022**

- Developed and implemented statistical and machine learning models in Python to analyze system performance data and predict hardware-related trends such as value fluctuations and pricing
- Built automated testing frameworks to validate model reliability under diverse runtime conditions

**Pipelined MIPS Processor Design in Verilog** | *System Developer* **Jan 2022 – Mar 2022**

- Designed and verified a 5-stage pipelined MIPS processor in Verilog, implementing ALU, control logic, D flip-flops, and memory-mapped I/O
- Developed testbenches and performed functional simulation using Vivado; compiled C programs to MIPS assembly to validate software-hardware integration