Miguel Salvacion

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Education

Carnegie Mellon University Pittsburgh, PA
B.S. and M.S. in Electrical and Computer Engineering — GPA: 3.77/4.00 — Dean's List *May 2027*

Relevant Coursework: Embedded Systems, Computational Design of Cyber-Physical Systems, Logic Design and Verification, Electronic Devices and Analog Circuits, Computer Systems, Structure and Design of Digital Systems

Extracurriculars: Filipino Student Association Treasurer

Technical Skills

Languages: C/C++, Python, System Verilog, SML, Assembly, MATLAB
Tools: Git/GitHub, Unix/Linux, EDA Software, Autodesk Fusion, Solidworks, Excel, Powerpoint
Hardware: Oscilloscope, Digital Multimeter, Function Generator, Logic Analyzer, Circuit Design, PCB Design, FPGA

Work Experience

Vehicle Hardware Engineering Intern | *Electric Vehicles, Underbody Systems* Jun 2025 – Aug 2025
Ford Motor Company *Detroit, MI*

- Analyzed electrical performance to identify voltage drops in sensitive control units and proposed hardware modifications to improve power-delivery reliability.
- Managed a technical audit of 50+ hardware requirements for three EV programs, identifying and resolving cross-functional gaps between systems engineering and hardware fabrication teams.
- Developed a cost-optimization strategy for underbody components by analyzing technical design specifications and supplier performance data, identifying significant savings for key components.

Embedded Systems Researcher | *Semiconductor Fabrication, RF Hardware* Jan 2026 – Present
CMU Hacker Fab *Pittsburgh, PA*

- Developed an automated RF power tuner for a sputtering chamber by integrating a Teensy 4.1 microcontroller with high-torque, servo-driven air-variable capacitors.
- Implemented a PID control algorithm to automate the reduction of reflected power (VSWR) and ensure stable plasma strikes throughout the thin-film deposition process.
- Designed a custom control PCB and shielding to filter electrical interference from the feedback loop and maintain a reliable 95W forward power delivery.

Undergraduate ECE Teaching Assistant | *Embedded Systems, Circuit Design* Jan 2025 - Present
CMU 18-349: Introduction to Embedded Systems *Pittsburgh, PA*

- Mentored students in the debugging of real-time kernels, specifically resolving issues with scheduler logic, context switching, and synchronization.
- Provided technical guidance to students on the development of firmware drivers for STM32 microcontrollers, facilitating the integration of sensors and actuators.
- Guided student teams through the full design cycle of an autonomous vehicle, providing oversight on PCB layout, system-level testing, and final mechanical assembly.

Projects

Real-Time Embedded Vehicle | *Embedded Systems, RTOS, PCB Design, C, Assembly* Aug 2025 - Dec 2025

- Designed a 2-layer PCB in Autodesk Fusion and developed C device drivers (I2C, UART, ADC) to integrate an STM32 microcontroller with motors, servos, and an LCD.
- Built a preemptive, multithreaded real-time kernel in C/ARM Assembly, implementing a Rate-Monotonic Scheduler (RMS), context switching, and system call handling.
- Implemented a PID control algorithm for motor speed regulation and conducted hardware-software integration.

Trash Collection Robot | *Robotics, Electro-Mechanical Systems, Serial Communication* Oct 2024 - Jan 2025

- Engineered a 9V quad-motor drive system using H-bridge drivers and optimized power distribution to support high-torque movement during heavy load collection.
- Implemented UART serial communication to enable seamless interaction between a Raspberry Pi handling computer vision with an Arduino Uno controlling the robot's movement.