Diego Lopez

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Intro

Embedded Systems Engineer with a passion for designing and integrating embedded software and hardware, seeking an internship for the Summer and Fall. **Available May 2025 to December 2025.**

Education

Rochester Institute of Technology - B.S. Computer Engineering Technology Expected May 2026
Dean's List Fall 2023
Relevant Coursework: Embedded Systems Design, Real-Time Operating Systems, Digital Electronics, Digital Signal Processing

Skills

Languages: C++, C, VHDL, Python, ARM Assembly
Environments and Software: Git, GitHub, MATLAB, Quartus Prime, Modelsim, Linux, LTSpice, Microsoft Office
Embedded Systems: FPGA, STM32 Microcontrollers, FreeRTOS, UART, I^2C, SPI, ThreadX RTOS, Logic Analyzer, Oscilloscopes

Relevant Projects

RIT Electric Vehicle Team · Firmware Team · Rochester, NY 09/2023 - Present

- Worked with a team to create a **C++ abstraction layer** to integrate an **RTOS** into a custom library built on top of STM32 HAL.
  - Implemented the **ThreadX submodule** and configured CMake to build the RTOS as part of the library.
  - Composed a ThreadX demo showcasing the creation and use of RTOS tools, including **threads, semaphores, and queues,** serving as a practical example for users to understand and integrate RTOS features into the library.
  - Designed a dedicated **UART** class for ThreadX, enabling thread-safe UART communication, that can be built upon for further threadsafe drivers.
- Collaborated with circuit board designers to ensure functionality on Vehicle Control Unit (VCU) PCB:
  - Tested **UART** and **CANopen** to ensure proper communication between the VCU and other boards.
  - Verified **CAN interrupt signal** transmission between microcontrollers to confirm reliable data exchange.
  - Used a **Digital Multimeter** to check continuity, detect short circuits, and validate reset signal transmission from the Hardware Monitor microcontroller to the Motor Controller MCU.

Arduino Temperature Signal Processing 01/2025

- Built a data collector using an Arduino Uno and a temperature sensing IC. Plotted raw data, mean, and standard deviation in MATLAB for further analysis.

Embedded VHDL and C Audio Processor 11/2024

- Created and verified a custom component in **VHDL** to implement high-pass and low-pass FIR filters for digital signal processing of .wav audio files. Established a system to allow real time switching between filters.
- Developed **C** code to load the audio file into SDRAM and read it at 48kHz. Determined filtering based on two switches, sent the audio data to the filter, and then transferred it from the filter to the audio component.

Embedded VHDL and C Servo Controller 10/2024

- Designed a custom **VHDL** component to control a servo motor using a **PWM signal**.
- Developed C code to implement the custom component to control the motor's sweep angles.

ARM Assembly Counter 09/2024

- Composed a counter on an Intel Cyclone V FPGA using VHDL and **Assembly**, where VHDL displayed the counter value on an LED display.
- ARM Assembly handled the counter logic and detected button inputs to alter the counter based on switch settings.