

Miguel F Loy

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Skills

CAD: SolidWorks, Autodesk Inventor, Fusion 360, KiCad

Circuit & Hardware: LTspice, PSpice, Multisim, Digital Logic Design, FPGA Design (VHDL, Xilinx Studio)

Analysis & Simulation: MATLAB

Development: Python, C, C++, VHDL, Assembly (Microchip Studio), Git, Linux, Docker

Embedded Systems: Arduino, Raspberry Pi, Microcontrollers (AVR/STM), Sensor Integration

Other Tools: Unraid, ROS2, 3D Printing, Soldering, Troubleshooting

Experience

R&D Engineering Intern, Los Alamos National Lab – Los Alamos, NM Summer 2024 – Present

- Modernized legacy scientific instruments with updated electronics and microcontrollers to improve reliability.
- Calibrated and customized instruments to align with project specifications, workflow needs, and client feedback.
- Collaborated with multidisciplinary teams to test and validate new circuit prototypes for field deployment.

Robotics Lab Tech, Miami Dade College – Miami, FL Spring 2024 – Present

- Improved lab efficiency by maintaining and calibrating robotics instruments for over 30 students weekly.
- Trained students on instrument use and safety, ensuring consistent experiment results.
- Managed daily lab readiness by inspecting and servicing all equipment before class sessions.

Engineering CAD Tutor, Miami Dade College – Miami, FL Spring 2023 – Spring 2024

- Tutored students in **SolidWorks** and **Fusion 360**, improving design accuracy and modeling efficiency.
- Tutored students in circuits, electronics, and microcontrollers, strengthening comprehension and lab performance.
- Assisted faculty by clarifying complex topics and providing one-on-one support to enhance student performance.

Projects

Wayfinder Mapping Robot miguelloy.me/projects

- Developed an autonomous mapping robot using LIDAR, IMU, and SLAM algorithms in Python to generate real-time 2D maps.

Self-Made NAS Server miguelloy.me/projects

- Built a personal network-attached storage system on Linux with Docker containers for AI model hosting, data backup, and media streaming.

Windmill PWM Motor Controller miguelloy.me/projects

- Built a PWM motor controller on an Arduino-class MCU using an H-bridge circuit, programmed in assembly through Microchip Studio.

Mini-Vending Machine FPGA miguelloy.me/projects

- Programmed an FPGA vending system in VHDL using Xilinx Vivado/ISE, implementing coin counting logic, seven-segment displays, and automated dispensing control.

Custom-Made 3D-Printer miguelloy.me/projects

- Built and assembled a custom FDM printer using open-source firmware and CAD-designed components to improve print quality and stability.

Binary/Digital Clock miguelloy.me/projects

- Designed and built a binary digital clock using 74LS-series logic ICs, implementing counters, decoders, and multiplexers for time display.

Education

Miami Dade College – BS in Electrical & Computer Engineering Technology

August 2022 - Present

Florida Polytechnic University – BS in Computer Engineering (Transferred)

August 2015 – April 2019