

Michael Denis

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Education

University of Miami

M.S. in Electrical & Computer Engineering

B.S. in Electrical Engineering

Coral Gables, FL

Anticipated May 2028

Expected December 2025

- **Relevant Coursework:** Communication Systems; Digital Signal Processing (MATLAB labs); Electromagnetism; Operating Systems; Systems Programming; Computer Organization & Design; Processors: Hardware/Software; Electronics I-II (with lab)

Projects

RV32I Soft-Core CPU

June 2025

- Non-pipelined RV32I with a 4-state controller and Harvard I/D; unified memory map with MMIO; synthesized/programmed on a **Gowin GW5A** FPGA and validated on hardware (Fibonacci from on-chip memory).
- Verified ISA compliance with **cocotb** and **pyuvvm**: ran directed and small random tests, checked results against a Python model and **closed timing at 120 MHz**.

FPGA Accelerator for Quantum Operations

Senior Design Expo Winner | December 2024

- Built an **Intel Arria 10 GX** accelerator for quantum time evolution $U(t) = e^{iHt}$, using a single-cycle complex matrix-vector engine with supporting units (add/sub, multiply, matrix inversion).
- Custom **SPI** stream (Raspberry Pi $\leftrightarrow$ FPGA) with CDC (2-FF); wrote Pi-side **C** and **Python** drivers for test/control and data transfer; documented area/latency trade-offs; **timing closed at 87 MHz** in Quartus.

Digital Signal Processor (ADSP-2100)

May 2024

- Implemented a VHDL model of the ADSP-2100 (ALU/MAC, memory system, sequencer); added built-in self-test to detect 20+ fault classes, reducing manual verification time.

PNG Image Processing Library

November 2023

- Wrote a C library to decode/encode PNG from raw bytes: chunk parsing (IHDR>IDAT>IEND), five PNG filters (None, Sub, Up, Average, Paeth), and Deflate via **zlib**.

Experience

RoviSys Building Technologies

Cleveland, OH

Systems Engineering Co-op

May – Aug 2025

- Simplified PLC and remote I/O (RIO) panels across multiple facilities—merged I/O lists, standardized pin maps/panel schedules, and cleaned up terminations/docs for first-pass bring-up.
- Implemented deterministic fan-control ladder logic with deadband and safety interlocks; built HMI screens and kept controller/HMI tags in sync (verified via tag reconciliation).

TLC Engineering Solutions

Miami, FL

Electrical Intern

May – Aug 2024

- Produced NEC-compliant 2D electrical designs in Revit (wiring, lighting, power distribution) for **3** commercial/residential projects, collaborating with a team of **8** engineers to meet deadlines.

University of Miami College of Engineering

Coral Gables, FL

Teaching Assistant

Aug 2023 – Present

- TA for ECE 118 (**C++ programming fundamentals**) and ECE 316 (**VHDL digital design fundamentals**); led weekly labs and office hours for **50+** students, graded exams/projects, and validated designs in **ModelSim/Quartus** on FPGA boards.

Technical Skills & Activities

Embedded & Programming: C/C++; MATLAB; drivers (UART, SPI); Python; Bash/Make; Git; Linux

Tools & Debug: GCC/GDB; KiCad; logic analyzer; oscilloscope; Verilator/GTKWave; ModelSim/Quarta; Vivado; Quartus Prime

FPGA/RTL: SystemVerilog/Verilog, VHDL; STA/SDC/CDC; synthesis & P&R; timing closure

Verification: cocotb; pyuvvm

Activities: Treasurer (Levantine Student Union)