Fernando Oliver Mediavilla

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EDUCATION

Massachusetts Institute of Technology Cambridge, MA   GPA: 4.8

Bachelor of Science in Computer Science and Electrical Engineering

Relevant Coursework: Power Electronics Laboratory, Digital Systems Laboratory, Microcomputer Project Laboratory, Computer Systems Engineering, Computation Structures, Introduction to Algorithms

Teaching Assistant   August 2024-Present

Circuits and Electronics (Fall 25), Physics II (Spring 25), Physics I (Fall 24)

EXPERIENCE

VR/AR at MIT   August 2023 – Present

President   *Cambridge, MA*

- Lead and organize **Reality Hack**, the world's largest mixed-reality hackathon, hosting 500+ hackers and over 1,000 guests annually. Managed hardware kits, starter code, technical documentation, and a sponsorship budget exceeding $200K.
- Deliver workshops on hardware and software development—including VR development, haptics, Unity, Unreal Engine, ESP32, soldering, circuit design, and 3D printing—to support student learning and community engagement.
- Co-host MIT's official course *Designing Virtual Worlds*, supporting students and TAs and contributing teaching materials and documentation.

Design Museum of Barcelona   June – August 2025

Technical Intern   *Barcelona, Spain*

- Engineered a distributed wireless network of 10 Raspberry Pis to recreate the functionality of a 1970s Chilean operations control room, serving as the centerpiece of the temporary exhibition **How to Design a Revolution**.
- Performed routine maintenance and resolved runtime issues during public operation, supporting a seamless experience for more than 50,000 visitors.
- Produced comprehensive technical documentation and GitHub resources to ensure project continuity, and created simplified maintenance guides for museum staff to manage the system post-internship.

PROJECTS

FPGA Hero | *FPGA, Audiovisual Sync, Real-time graphics, HDMI, SD Cards*   November – December 2025

- Recreated the 2005 rhythm game *Guitar Hero* on a Field-Programmable Gate Array, implementing HDMI video output, 44.1 kHz audio playback, and external custom-built wooden instruments.
- Wrote over 2,000 lines of SystemVerilog to implement the full hardware stack, including FSMs, PWM audio drivers, FIFOs, BRAM structures, an SD-card controller, and HDMI signaling protocols.
- Designed and built custom wooden guitar and drum peripherals interfacing directly with the FPGA hardware.
- Achieved an audiovisual synchronization error of under 1 millisecond.

Go-Kart Control System | *Power Electronics, Efficiency, Controls, PID, Analog*   November – December 2025

- Designed a custom analog motor controller for a 24 V go-kart capable of delivering up to 100 A and 2.4 kW, supporting bidirectional drive and variable-speed control.
- Designed a closed-loop analog PID controller using tachometer feedback, delivering stable speed regulation with a rapid 0.1-s response time.
- Added load-braking and safety mechanisms, selecting inductors, capacitors, and power-stage components to balance efficiency, thermal performance, and cost.
- Produced detailed documentation including calculations for 50+ components and 20+ oscilloscope captures validating system behavior.

TECHNICAL SKILLS

Languages: Spanish and English (Bilingual)

Programming Languages: Java, Python, C, C++, JavaScript, HTML/CSS, SystemVerilog, Minispec, Assembly

Technical Proficiencies:: Embedded Systems, microcontrollers, Full-stack development, Algorithm design, Signal processing, power electronics, FPGA development, Documentation, System-level design & architecture

Developer Tools: Github, VS Code, Visual Studio, Unity, Eclipse, Unreal Engine, Fusion 360, LaTeX

Makerskills: Woodworking, Welding, 3D Printing, Waterjet, Lathe, & mill operation, Laser Cutting, Soldering