D. Sebastian Heredia

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EDUCATION

Harvey Mudd College, Claremont, CA *Exp. Grad. May 2027*

- *B.S. Engineering (GPA: 3.52), Dean's List*
- Mudd Amateur Rocketry Club, Claremont Division-III Ultimate Frisbee, SALSA Mudd

Relevant Coursework

- In Progress: Microprocessor Systems: Design & Application | Fall Engr. Clinic I | Chemical & Thermal Processes
- Completed: Digital Elec. & Comp. Engr. | Design & Manufacturing | Engr. Systems | Material Science | Applied Math for Engr. | Experimental Engr. | Continuum Mechanics

PROJECTS

Apple Clinic Project at Harvey Mudd College, Claremont, CA *August 2025 – Present*

Fall Clinic I Engineering (NDA)

- Automating the polishing of elastomeric materials for highly cosmetic purposes to reduce cycle time.

Autonomous Surface Vehicle (ASV), Claremont, CA *March 2025 – May 2025*

Experimental Engineering

- Designed, developed, and deployed an autonomous surface vehicle to collect shallow water depth data in real-world conditions using a Teensy 4.0 microcontroller and protoboard to interface three low-cost sensing systems ($50 budget).
- Integrated a custom 3D-printed winch and spool system with a Hall effect sensor, pressure sensor, and motor-based voltage sensor to measure underwater water depth through mechanical, electrical, and pressure-based methods.
- Conducted field deployment and analyzed serial data using MATLAB to demonstrate that low-cost, multi-sensor systems can effectively generate high-resolution bathymetric maps for shallow water zones (e.i. Baby Beach at Dana Point, CA).

Underwater Acoustics & Fourier Analysis Method, Claremont, CA *February 2025*

Experimental Engineering

- Designed and tested an underwater acoustic localization system using beacon-emitted sine waves and an electret microphone circuit, incorporating FFT analysis via oscilloscope and MATLAB to identify multiple signal frequencies.
- Built and waterproofed a custom microphone interface circuit using dual-rail op-amps to amplify and process zero-centered signals, enabling accurate detection of beacon tones in a controlled test tank environment.
- Applied the Nyquist-Shannon sampling theorem to resolve multipath interference patterns and modeled power decay analytically to estimate position.

Pomona College Neuroimaging Apparatus Research, Claremont, CA *February 2024 – May 2024*

Engineering Design & Manufacturing

- Improved signal clarity of Pomona College's functional Near-Infrared Spectroscopy (fNIRS) brain oxygen-level monitoring device for individuals with dense hair types (3C, 4A), improving performance from critical to acceptable.
- Machined prototypes to verify proof of concept, conducted measurements and created detailed sketches for prototype designs, and refined iterations based on client input and feedback from professors and peers during design reviews.
- Created comprehensive process routers for all prototype designs, generated BOMs, organized meeting agendas, and documented project findings into reports to be shared with the team, client, and engineering faculty for feedback.

WORK EXPERIENCE

E79: Engineering Systems Tutorial TA, Claremont, CA *September 2025 – Present*

Tutorial TA

- Support 50+ undergraduate Sophomores students twice a week in analytically solving linear, time invariant systems.

Harvey Mudd College Machine Shop, Claremont, CA *September 2024 – Present*

Shop Proctor

- Teach 100+ first time users each semester how to use the metal shop and wood shop equipment safely to prevent injury.
- Provide users with on-the-spot guidance to improve machining techniques, fostering confidence and competence.

SKILLS

- **Software & Programming:** Python, C/C++, SystemVerilog, KiCad, MATLAB, LabVIEW, Arduino, SolidWorks, COMSOL, Quartus, Questa, Lattice Radiant, REDCap, SEGGER, R, MS Office, CSS/Markdown, Quarto, GitHub
- **Hardware & Lab:** Oscilloscope, Soldering, CNC Operations, Mill, Lathe, Router, Laser Cutter, 3D Printer, Power Tools
- **Other:** Spanish (Native/Fluent), California Seal of Biliteracy in Spanish