Diego Peñaloza Niiler

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EDUCATION

Northwestern University | McCormick School of Engineering — **Evanston, Illinois**
B.S in Mechanical Engineering, Robotics Concentration — *September 2024 - Expected June 2028*

- **GPA: 3.43/4.00 · Dean's List, Spring 2026**
- **Relevant Coursework:** Mechatronics, Electronics Design, Mechanical Design and Manufacturing, Product Design, Thermodynamics, Mechanics of Materials, Properties of Materials, Fluid Mechanics, Intro to Aerospace Engineering

WORK EXPERIENCE

Pacific Gyre — **Oceanside, California**
Hardware Engineering Intern — *June 2026 - August 2026*

- Redesigned ocean-drifter pressure subsystem around BMP581, reducing sensor cost from ~$800 to ~$3 per unit
- Designed custom PCB, mechanical housing, and C464 naval-brass pressure tube in CAD, with O-ring seal to isolate electronics
- Developed STM32 firmware for SPI sensor communication, pressure-data acquisition, and automated in/out-of-water detection

Meemo — **Evanston, Illinois**
Firmware and Robotics Intern — *October 2025 - Present*

- Developed and tested ESP32 firmware for UWB-based child-tracking wearable tech startup, designing state machine with anchor-tag pairing, alert thresholds, and LED, haptic, and audio feedback for startup, transition, and out-of-range events
- Debugged pairing, boot-sequence, and button-control issues while optimizing sleep-state behavior to reduce power draw and doubled runtime, collaborating with team to refine control flow and reduce failure states

Northwestern University Space Technology and Rocketry Society — **Evanston, Illinois**
Payload Mechanical Team Member — *September 2024 - Present*

- Designed and fabricated internal payload sleds for 2026 IREC, creating secure mounting structure for launch vehicle avionics, generated CAM toolpaths to machine aluminum thrust plate and bulkheads on CNC mill for 6,714 N·s impulse rocket
- Designed fin clamp system in CAD for 2025 NSL with launch vehicle subteam, 3D printing with multiple filament materials (ABS, PLA, Nylon) and lattice structures, testing under tensile loads and aerodynamic forces in stress machine and wind tunnel

Bethesda Outdoor Pool — **Bethesda, Maryland**
Head Lifeguard — *June 2021 - September 2025*

- Oversaw safety for ~400 daily patrons by enforcing pool rules, responding to emergencies, while monitoring water chemistry and assisting pool operators with pH and chlorine levels, taught swim lessons 2x weekly to children and adults

PROJECTS

Closed-Loop DC Motor Control System — **March 2026**

- Implemented 1 kHz PI current-control loop and 200 Hz PI position-control loop for DC motor on Raspberry Pi Pico, using 20 kHz PWM drive and encoder feedback for closed-loop trajectory tracking
- Developed embedded C/Python firmware for motor testing and trajectory tracking, logging 400-sample current-response tests and ~4000 position samples to evaluate gain tuning and step/cubic trajectory performance

NAR Level 1 High Power Rocket Certification — **June 2026**

- Modeled 45.5 in fiberglass rocket in Onshape/OpenRocket, verifying CG/CP, 2.93 cal stability margin for flight on H182 motor
- Constructed and launched rocket using fiberglass surface prep, epoxy-bonded motor/fin assemblies, and altimeter-controlled parachute deployment at ~300 ft, achieving 2,487 ft apogee and successful recovery

Nylon 12 Single-Pivot Rear Bicycle Brake Caliper — **May 2026**

- Designed caliper within bike-specific design-space constraints, using topology optimization, FEA, DFM, and GD&T for SLS Nylon 12/powder-bed-fusion prototype
- Reduced peak von Mises stress by 7.85 MPa and total deflection by 1.37 mm; manufactured prototype passed braking validation test with a 5.3 m stopping distance against a 7.62 m ISO-adjusted threshold

SKILLS

Embedded Systems: ESP32, STM32, Raspberry Pi Pico
Programming Languages: C/C++, MATLAB, Python
Engineering Software: SolidWorks, Siemens NX, Fusion 360, Onshape, Altium, CircuitMaker, OpenRocket, VS Code
Machining Tools/Lab Equipment: Lathe, Mill, Bandsaw, CNC Mill, Oscilloscope, Multimeter, Soldering
Activities/Interests: Applied Technologies Club, Northwestern Club Ski Team, Backpacking/Hiking, Surfing, Acoustic Guitar