

FERMÍN GENARO MARTÍNEZ CONTRERAS

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EDUCATION

University of San Diego (USD) — B.S./B.A., Mechanical Engineering
Dean's List: Spring 2025

Expected May 2027
GPA:3.48

Southwestern College (SWC) — A.S.-T, Engineering
Dean's List: Fall 2023, Spring 2024, Fall 2024

Fall 2024
GPA:3.25

SKILLS

Mechanical Design: SolidWorks, Creo Parametric 8, PTC Windchill, design iteration, tolerance/fit, technical documentation

Prototyping & Fabrication: FDM 3D printing, laser cutting/engraving, CNC routing (Carvey), machine shop (lathe/mill/drill press), taps/dies

Engineering Automation & Test: Microsoft Copilot Studio, Power Automate (cloud/desktop), COMET vibration control software, UI automation, workflow orchestration

Analysis & Professional: Python, MATLAB, Excel/Word/PowerPoint, Git (basic), stakeholder communication, bilingual (English/Spanish)

PROJECTS

3D-Printed NFC/RFID Contactless Business Card, Personal Project

Nov 2025 - Dec 2025

- Engineered a 3D-printed business card prototype by embedding NFC/RFID tags and magnets to enable contactless sharing and repeatable assembly.
- Iterated card geometry and pocket tolerances through fit-testing to improve tag alignment, durability, and day-to-day usability.
- Verified tag placement and read functionality through repeated handling and assembly trials to ensure consistent performance.

Wobbler Engine Machining and Assembly, University of San Diego, San Diego, CA

Nov 2025 - Dec 2025

- Machined and assembled a functional wobbler engine using a lathe, mill, drill press, and taps/dies to produce accurate features and clean threads.
- Achieved first-run operation by controlling setup, alignment, and fit during fabrication and final assembly.
- Verified motion and sealing performance through test runs, making minor fit adjustments to ensure reliable function.

Baja SAE, Southwestern College, Founding Team Member

Dec 2023 – May 2024

- Built the team's first Baja SAE vehicle within a one-month timeline by coordinating rapid fabrication and assembly, resulting in a first-attempt technical inspection pass as first-time competitors.
- Developed and applied a pre-inspection checklist and organized documentation/pre-checks to reduce rework and support first-pass technical inspection.

NASA Community College Aerospace Scholars (NCAS), Southwestern College, Member

Jun 2023 - Aug 2023

- Executed individual and team NASA Community College Aerospace Scholars (NCAS) missions by completing required deliverables and presentations to meet program objectives.
- Led technical work during the NCAS robotics competition by coordinating team tasks and troubleshooting hardware/software issues, helping the team earn 1st place and receiving Team MVP recognition.

RELEVANT EXPERIENCE

EchoStar / Hughes Network Systems,

San Diego, CA

Mechanical Engineering Co-op

Aug 2026 – Present

- Continue prototype drone development with primary focus on Creo Parametric 8, creating and revising parts and assemblies for airframe, structural supports, protective features, and hardware mounting.

- Manage workspace updates, versions, and revisions through PTC Windchill while iterating geometry to support fit, manufacturability, and integration of prototype hardware.
- Translate evolving drone requirements into prototype-ready CAD models and troubleshoot feature and geometry issues through hands-on design iteration.

Mechanical Engineering Intern

Jun 2026 – Aug 2026

- Developed an AI-assisted workflow for random vibration test preparation by integrating Microsoft Copilot Studio, Power Automate cloud/desktop flows, and COMET vibration control software.
- Designed a beginner-friendly, human-in-the-loop operator experience that guides test inputs and flags questionable or invalid configurations while preserving operator approval.
- Built and troubleshoot UI automation for legacy test software, addressing window focus, keyboard navigation, file paths, variables, runtime permissions, and cross-environment execution.
- Evaluated direct modification of proprietary test-project files, identified reliability and maintainability limits, and redirected development toward a layered UI-automation architecture.
- Authored detailed handover, onboarding, and troubleshooting documentation and presented technical work to engineers, managers, and nontechnical stakeholders.
- Contributed to Creo/Windchill drone design and engineering research, including prototype components, propulsion compatibility, and FDM 3D-printer platform evaluation.

Engineering Exchange for Social Justice (EXSJ)

Jan 2026 – Present

CAD Engineering Assistant

Accessible Electronics Cubes Project

- Apply DFM/DFA and iterative prototyping to convert accessibility-focused electronics concepts into manufacturable designs using SolidWorks, FDM printing, and tolerance-driven iteration.
- Lead CAD development of modular housings and interfaces using rectangular magnets and steel components, tuning fit and alignment to improve repeatability and day-to-day durability.
- Produce fabrication-ready CAD, technical drawings/notes, revision tracking, and assembly guidance to support repeatable builds and reliable team handoff.

Tijuana River Estuary / McCoy Trail Accessible Wayfinding Project

- Supported design and production of 33 unique NaviLens accessibility signs for the Tijuana River National Estuarine Research Reserve / McCoy Trail, translating stakeholder requirements into production-ready layouts for welcome, trail, restroom, and native-plant signage.
- Designed and fabricated mounting solutions and entrance signage, selecting materials and processes with outdoor durability, readability, and manufacturability in mind.
- Evaluated ACM/Dibond and PVC substrates with and without anti-graffiti overlamine through field readability and cleaning tests to inform material and finish decisions.
- Coordinated with stakeholders and the print vendor through quoting, proofing, and revision cycles; identified missing directional arrows, verified corrected codes in NaviLens, and supported final production handoff.

Montgomery Magnet Middle School, San Diego, CA

Aug 2025 – Jan 2026

College Corps Engineering Fellow

- Designed and prototyped manufacturable school deliverables (signage and makerspace support tools); iterated designs based on stakeholder feedback.
- Fabricated prototypes using FDM 3D printers, laser engraving/cutting, and Carvey CNC; prepared files and documented processes for repeatable results.
- Authored a Carvey CNC user manual (workflow, safety, best practices) and maintained build notes/revision tracking to support consistent fabrication and training.

SWC Drone Department, Chula Vista, CA

Oct 2023 – Mar 2025

Design Engineer Assistant

- Produced detailed CAD models for airframe components, jigs, and mounts; conducted tolerance checks, optimized designs for additive manufacturing, and prepared files for 3D printing.
- Managed revisions and build notes; supported fabrication and integration into working prototypes.

RESEARCH EXPERIENCE

USD Physics & Biophysics Lab

San Diego, CA

Undergraduate Summer Researcher

Jun 2025 – Aug 2025

- Built a Python analysis pipeline to process microscopy image stacks and quantify particle dynamics with reproducible outputs.
- Developed trajectory filtering/classification scripts; validated results with plots and parameter sweeps. Tools: Python (NumPy/Pandas/SciPy/Matplotlib/Trackpy), Git (basic).

USD Physics & Biophysics Lab - Universidad de Guanajuato (International Research Program)

Guanajuato, MX

Undergraduate Summer Researcher

Jun 2025 – Aug 2025

NSF-Funded

- Applied DDM and single-particle tracking to quantify dynamics vs particle concentration and laser intensity; observed faster ISF decay at higher power.
- Computed MSD and long-time diffusion metrics across concentrations and laser powers; summarized trends for comparison.
- Presented findings at SWC and USD symposium.

OBES Lab, San Diego State University

San Diego, CA

Undergraduate Researcher

Jun 2023 – Aug 2023

- Designed a Layer Separation Instrument (LSI) to improve a smartphone-integrated paper microfluidic (SiPM) device, speeding processing and reducing interaction.
- Iterated prototype builds and test runs; documented procedures and results to support reproducible evaluation and handoff.
- Presented design/testing results; tools: **SolidWorks**, rapid prototyping, basic lab instrumentation.

TEACHING & TUTORING

University of San Diego

San Diego, CA

Student Support Services (SSS) Tutor

Feb 2025 – Present

- Provide one-on-one and small-group tutoring in math, physics, and engineering by diagnosing concept gaps and coaching structured problem-solving to strengthen student performance.
- Organize and lead physics workshops by developing lesson plans and guided practice sets to reinforce core mechanics and E&M concepts.
- Support math workshops by facilitating group problem sessions and breaking down complex topics into step-by-step methods to improve student confidence and accuracy.

Southwestern College

Chula Vista, CA

MESA Program Tutor

Oct 2024 – Aug 2025

- Tutored STEM coursework by delivering one-on-one and small-group support and creating targeted practice materials to improve problem-solving skills and course outcomes.
- Led structured physics workshops by preparing example-driven lessons and guided walkthroughs to strengthen conceptual understanding and exam readiness.
- Maintained and repaired 3D printers by troubleshooting print failures, calibrating hardware, and performing routine upkeep to keep lab equipment reliable for student projects.

LEADERSHIP

Society of Hispanic Professional Engineers (SHPE), Southwestern College, Vice President

Aug 2022-Dec 2024

- Organized peer-mentorship programming and coordinated technical workshops (LinkedIn, resume, industry prep) to increase member engagement and support STEM retention.
- Led an industry networking night by recruiting company representatives and facilitating a community-college-to-industry panel, connecting students with professionals and actionable career guidance.