Hugo de Mendoza

Mechanical Engineer and Robotics
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Relevant Skills

Technical Skills: SolidWorks (CSWP), Creo Parametric, Fusion 360, AutoCAD, Ansys, FEA, CFD, Arduino, 3D Printing, Rapid Prototyping, Embedded Systems, Controls, Project Development, Project Management, Project Leadership
Software Tools: Python, C++, MATLAB, ROS2, Excel, OpenCV, Github
Robotics / Perception: Jetson Nano, IMU, Depth perception (OAK-D)

Education

University of California San Diego Expected Graduation 06/2026
Bachelor's in Mechanical Engineering combined with Robotics and Controls, Master's in Robotics ***GPA**: 3.75*

Coursework: Statics and Dynamics, Thermodynamics, MATLAB, Linear Circuits, Fluid Mechanics and Heat Transfer, Mathematical Physics, Computational Methods, Statistical Methods for Engineers, Solid Mechanics, Signals and Systems and Linear Control, Embedded Controls and Robotics, Robotic Planning and Estimation, Intro to Autonomous Vehicles, Computational Methods for Design, Behavior of Materials

Tutor: Intro to Mechanical Design, Statics and Intro to Dynamics, Design Studio Assistant

Clubs: SHPE (Society of Hispanic Professional Engineers), Triton Neurotech, EWH (Engineering World Health)

Experience

SwirlX – *SWE Intern/Lead – San Diego, CA* 06/2025 – 09/2025

- Led R&D by designing heat exchanger systems, validated via CFD (ANSYS) and tests, achieving 40% pressure drop improvement.
- Engineered JavaScript automation script, cutting 5 hours/week of manual labor.
- Created the company website using HTML and CSS to improve engagement and brand presence.

Alcon – *Mechanical R&D Intern – Fort Worth, TX* 06/2024 – 09/2024

- Executed rigorous testing protocols on medical devices, improving reliability across product lines.
- Analyzed failure modes using Six Sigma with Creo CAD to resolve shipment integrity issues.
- Investigated 200+ devices using video and data models to find root causes of complaints.

Wearable Biosensor Research – *Undergraduate Lab Researcher – UC San Diego* 09/2024 – Present

- Developing 1 publication in biomarker sensing.
- Performed FEA in Ansys on flexible biosensor substrates, validating experimental results and accelerating the design process by 3 months.
- Modeled microfluid channels in COMSOL to optimize sweat extraction by at least 50%.

Bioinspired Robotics & Design Lab – *Undergraduate Lab Researcher – UC San Diego* 02/2025 – Present

- Designed and fabricated soft sensors; tested and controlled resistance under deformation.
- Calibrated and debugged 3D printers for consistent TPU printing with complex shapes.

Projects

Self-Balancing Bike – *Personal Project* 10/2025 – Present

- Assembled mechanical + embedded system: 3D-printed frame, reaction wheel, DC motors, IMU, and controller.
- Implemented IMU fusion & real-time PID for roll stability, measuring latency and torque response.
- (Future) Add depth perception via OAK-D + Jetson, and ML / RL-based control for improved navigation and recovery.

SteeAir – *Gesture-controlled RC Car* 01/2025 – 03/2025

Project Link: github.com/UCSD-ECEMAE-148

- Built real-time gesture recognition mapping 5 inputs using OpenCV on Jetson Nano to enable controller-free steering.
- Connected perception and actuation via ROS2 nodes for integrated control.
- Implemented 3D LiDAR obstacle detection with override logic to prevent collisions within 1 foot of the vehicle.

Build A Robot – *Group Project* 04/2023 – 07/2023

Project Link: Team Page

- Design and Manufacture a robot using aluminum, acrylic, and 3 RC Motors that consists of 3 components: a drivetrain, a lift mechanism, and a claw.