

# Alex Pacheco Santiago

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## EDUCATION

University of California, San Diego (UCSD) — B.S. Mechanical Engineering

Sep 2022 - Jun 2026

## EXPERIENCE

Leica Biosystems (Danaher) — Hardware Engineering Intern | Vista, CA

Jun 2025 - Sep 2025

- Recovered and re-established CS2 configuration baseline (CAD/BOM/drawings) to match as-built production; improved BOM match **15/60 (25%) to 57/60 (95%)** by adding 25 current components and removing 30 obsolete parts; released updates via SOLIDWORKS PDM
- Resolved ~100 SOLIDWORKS CAD/assembly failures by repairing mates/structure, restoring missing/obsolete components, and rebuilding stable SOLIDWORKS/PDM assemblies for engineering and manufacturing
- Produced and released updated assemblies/drawings with GD&T; used PDM revision control/approvals; performed assembly checks and flagged mate/fit issues, nonconformances, and revision mismatches
- Executed 15+ manufacturing build/teardown procedures and 5 formal V&V procedures; ran lifecycle durability testing (3x360 cycles) and documented pass/fail criteria, discrepancies, and results in structured reports
- Built an Excel traceability tracker for part/requirement status; used Jira/Confluence for issue tracking and documentation; performed checks using calipers, torque wrench, and height gauge; configured/tested motors and XY stages via Linux procedures

Triton Robotics — Mechanical Engineer

Jul 2024 - Present

- Engineered a **1:1** direct drive turret upgrade (replacing a **2:1** belt/pulley system) by redesigning the motor mount, bearing plate stack, and slip-ring interfaces, reducing service time by **40% (15 to 9 mins)**.
- Directed mechanical packaging and subsystem interfaces under strict weight, cost, and spatial constraints; collaborated with the chassis team to ensure seamless fit and service access.
- Designed 7 custom components (motor covers, mounts, protective features) and integrated robust fastening solutions (**M3/M4 heat-set inserts, embedded hex nuts**) to optimize serviceability.
- Prototyped components rapidly utilizing 3D printing, waterjet, and laser cutting; managed hardware sourcing via McMaster-Carr and iterated designs to resolve complex tolerance stack-ups.
- Mentored junior team members on CAD standards, fabrication techniques, and system integration

## PROJECTS

Triton UAS — Lead Engineer, Onboarding Fixed-Wing Aircraft

Sep 2024 - Dec 2024

- Spearheaded the rapid end-to-end development of a V-tail UAV within a strict one-week timeline, managing the complete process from initial concept and CAD to final fabrication.
- Directed motor and electronics integration and executed a shakedown flight that successfully validated control systems, structural integrity, and power delivery (achieved ~40s of controlled flight).

UCSD Mechanical Design Project — Ball Retrieval Robot

Sep 2023 - Dec 2023

- Engineered a competitive ball retrieval robot utilizing rigorous iterative design, custom fabrication, and test-driven performance tuning.
- Attained a peak throughput of 20 balls in 15 seconds with an ~80% (8/10) success rate, securing a 6th-place finish out of 12 competing teams.
- Designed and integrated a 2-wheel friction drivetrain and a double reverse four-bar mechanism for container lifting and transport

## LEADERSHIP

Team Captain — UCSD Intramural Soccer: coordinated weekly scheduling/communication and maintained execution under tight timelines

## SKILLS

**CAD/Docs:** SOLIDWORKS (PDM), Onshape, Fusion 360, AutoCAD; drawings, GD&T; DFM/DFA; assembly/mate debugging; revision control and approvals

**Analysis:** Basic FEA Solidworks Simulation; hand calculations for stress/deflection and design checks (cantilever validation)

**Mechatronics:** Wiring/connectors, screw terminals; soldering; Arduino integration (motor, encoder, sensor, servo); multimeter, oscilloscope; read wiring diagrams/schematics

**Manufacturing/Test:** Build/teardown procedures, V&V execution, pass/fail reporting, discrepancy documentation, traceability; metrology: calipers, height gauge, torque wrench

**Software/Tools:** Excel; MATLAB (data cleaning, plotting, curve fits); Jira, Confluence