Alexander Vazquez

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Education

University of Florida   (Expected Graduation: **May 2026**)
B.S. **Mechanical Engineering**   GPA: (3.40/4.00)

Professional Skills

- **Manufacturing**: DFM, Process Development, GD&T, Composite Manufacturing, Laser Welding/Cutting, PFMEA, CNC
- **Software**: SolidWorks, Autodesk Fusion 360, AutoCAD, CATIA V6/3DExperience, MATLAB, Python, Atlassian Suite, Microsoft Office Suite, STAR-CCM+, SQL, Hex, Databricks, LabView, Arduino, CNC g-code, FEA (Abaqus, Ansys)
- **Languages**: Spanish, English

Work Experience

Rivian Automotive
Manufacturing Engineering Intern, Battery   (May 2025-December 2025)

- Championed high cycle fatigue testing on aluminum alloy and nickel-plated steel cell-to-current collector coupons to validate ultimate strength for various laser weld patterns.
  - Cross-functionally worked with failure analysis, reliability, quality, and design teams to validate weld geometry and improve average joint strength by 44%, adjusting multiple weld power, seam length, and pitch parameters.
  - Increased both coupon production speed from <1 ppm to 8 ppm and process capacity developing CNC automation programs using Trumpf Trucontrol g-code
  - Increased coupon production process capacity from 6 parts to 24 parts by designing modular fixturing and clamping setups using SolidWorks for welding coupons of various geometries.
  - Coded a data visualization tool in MATLAB used to evaluate weld strength consistency by comparing datasets and plotting an empirical and GEV CDF to model the probability of a weld exceeding the reliability requirement.
  - Organized the production schedule and set deadlines for coupon production, procurement, and testing in Jira and logged production instructions, meeting notes, and testing results in Confluence.
- Redesigned and commissioned weld clamps that mimicked the footprint of production line laser weld clamps for usage in a patented weld mask on the pilot line laser welding station.
- Detected weld-defects using an AI powered vision and laser monitoring system, feeding weld imagery as well as plasma, temperature, and back reflection readings into a machine learning program used to categorize good and bad welds.
- Assisted in the implementation of a non-destructive pull test to the module manufacturing line, verifying that AI-detected defects did not prevent welds from surpassing reliability requirements.
- Designed a reusable module frame for repeated usage in cell coupon production to replace PSA used to constrain current collector apparatus to cells and busbars during laser welding.
- Conducted a study on the busbar heat stake reworking process to determine a nominal adhesive volume per part to minimize squeeze-out and wrote a JES as instructions for station technicians.

Capstone Design Team
EEI Aerospace Estrado Team Leader   (January 2025-April 2025)

- Led my capstone design team in designing modular and height adjustable aircraft maintenance platform for HAECO sufficiently meeting all OSHA and budget requirements.

Gator Motorsports Formula SAE Design Team
Front Wing Design Lead   (June 2023-December 2023)

- Iterated through 20+ front wing designs in SolidWorks, simulating changes in the aerodynamic efficiency using Star-CCM+ and conducting FEA on the wing mounting structures using Ansys.
- Designed changes that would improve the overall package L/D by 11%, adding 12 lbs of downforce while reducing overall drag by 0.2 lbs, logging incremental changes in Excel and OneNote.

Automotive Engineer   (January 2022-June 2024)

- Crafted 3 different aerodynamics packages, including front wing, rear wing, undertray, and sidepods, for a formula-style race car to compete against other programs in an international design competition.
- Performed vacuum-assisted wet carbon fiber layups over both hotwired or CNC machined foam molds and 3D-printed filament molds and post-processed each device using techniques such as sanding and cutting to meet geometric tolerances.
- Organized team manufacturing scheduling and streamlined new design iteration analysis using Microsoft Excel which resulted in a 41% decrease in manufacturing time.
- Simulated the fluid dynamics of a replica battery pack in STAR-CCM+ to estimate the mass flow of air into the cell carriage and analyzed results to determine modification to cooling mechanism sizing and arrangement.