Rodrigo A. Diaz Salazar

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EDUCATION

Northwestern University **Evanston, IL**
Bachelor of Science in Mechanical Engineering (Aerospace Concentration) Expected June 2027
GPA: **3.53/4.00** | Academic Affairs Coordinator of Delta Tau Delta, NUStars, Aviation Club, Engineers for a sustainable world

PROFESSIONAL & RESEARCH EXPERIENCE

FAST-AM Lab **Evanston, IL**
Undergraduate Researcher March 2026 – Present

- Evaluate the effect of low-frequency mechanical substrate vibration (~500 Hz) on melt pool oscillation, solidification microstructure, and grain morphology in wire-laser Directed Energy Deposition of Inconel 718
- Design experimental matrix varying substrate vibration frequency to characterize columnar-to-equiaxed grain transition and assess impact on mechanical anisotropy and microstructural homogeneity
- Develop CFD simulation of melt flow under resonance conditions to validate hypothesis that substrate vibration at melt pool natural frequency amplifies melt flow and drives grain refinement

Tackform **Chicago, IL**
Engineering Design Intern January 2026 – Present

- Design vehicle-mounted accessories in SolidWorks, including device mounts and fairleads, and validated structural integrity and vibration resistance for automotive loads, resulting in components that meet safety standards and reduce prototype failures
- Developed parametric CAD architectures to accommodate varying device sizes, load paths, and vehicle interfaces, enabling rapid configuration changes and reducing redesign time
- Applied DFMA principles to designs released to third-party manufacturers, refining geometry and fastener interfaces to improve assembly robustness and ensure manufacturability

CertainTeed (Saint-Gobain) **Kansas City, KS**
Process Engineering Intern June 2025 – August 2025

- Managed daily operations of cold-end production line generating over $300K in product value daily; performed root cause analysis on mechanical and pneumatic system failures to restore uptime and product quality
- Identified recurring date-coder mechanical failures; led a placement redesign validated with OnShape layout drawings and coordinated installation across four bagger lines, reducing downtime by 5% and recovering approximately $2K per day in output
- Supported $2.2M bagger-system upgrades by sourcing components in SAP, developing layouts, and coordinating vendor quotes, which improved safety and serviceability, enhancing reliability and reducing maintenance time.

City National Bank of Florida **Miami, FL**
Digital Transformation Summer Analyst June 2024 – August 2024

- Built Excel workforce and cost models and used SQL and Qlik to clean, segment, and validate hundreds of client records, improving forecasting, budgeting, and digital transformation reporting across multiple business units at a $16B bank

Financial Planning Summer Analyst June 2023 – August 2023

- Developed branch performance targets and created structured, step-by-step turnaround plans for underperforming branches by diagnosing performance gaps and defining implementation actions to streamline cost and increase income and productivity

ENGINEERING & DESIGN PROJECTS

NUStars Rocketry August 2024 – Present

- Manufactured and integrated a fiberglass composite airframe using fiberglass sleeves and vacuum bagged layups over a 3D printed mandrel while controlling fiber placement, alignment, and interface fit to enhance laminate quality and preserve structural integrity
- Designed and fabricated a 3D-printed onboard camera housing with retention features and mounting interfaces sized for aerodynamic and launch loads; system recorded uninterrupted video during NASA Student Launch flight

Mars Rover EDL Fuel Optimization January 2026 – March 2026

- Simulated Mars EDL and optimized fuel consumption by 57% using SLSQP and COBYLA algorithms, enforcing constraints on touchdown velocity, event sequencing, and sky crane cable length across varying Martian atmospheric conditions

Modular Heat Sink January 2026 – March 2026

- Designed and binder-jetted a 316L stainless steel heat sink with wavy perforated fins, optimizing geometry through CFD and thermal FEA to achieve a 7°C temperature reduction over a conventional straight-fin baseline

Aircraft Wing Structural Analysis and Rib Layout Trade Study March 2025 – June 2025

- Modeled a Cessna-172-style wing in ANSYS under distributed takeoff lift loading; predicted 6.54 mm main-spar tip deflection, validated against Bernoulli-Euler beam theory, and assessed failure modes including buckling, spar bending, and rib crushing under limit load

SKILLS

Programming & Analysis: Python, MATLAB, SQL, RStudio, SAP, SIMULIA Isight, Qlik, Microsoft Office
CAD & FEA: SolidWorks, AutoCAD, OnShape, Siemens NX, ANSYS Workbench, GRANTA EduPack
Fabrication & Machining: 3D Printing, Binder Jetting, Laser Cutting, Bridgeport Mill, Drill Press, Bench Shear