NICHOLAS TORRES

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PROFESSIONAL SUMMARY

Mechanical Engineering junior focused on mechanical design, structural analysis, and electromechanical enclosures for automotive and aerospace applications. Experienced with SOLIDWORKS CAD and FEA, ASME Y14.5 GD&T, and prototype validation through physical testing. Designed and analyzed safety-critical Formula SAE vehicle components and supported the development of robotic mechanical systems through CAD redesign, analysis, and testing.

EDUCATION

Columbia University, School of Engineering and Applied Science (SEAS) — New York, NY
Bachelor of Science in Mechanical Engineering | Expected May 2027
Relevant Coursework: Heat Transfer, Mechanics of Solids, Thermodynamics, Mechanics of Fluids, Computer Graphics & Engineering Design

TECHNICAL SKILLS

CAD & Analysis: SOLIDWORKS (Parts, Assemblies, Drawings), SOLIDWORKS Simulation (FEA)
Design & Standards: GD&T, ASME Y14.5, Structural Analysis
Manufacturing & Tools: CNC Machining, Waterjet Cutting, 3D Printing, Milling, Bandsaw
Programming: Python, ROS2 (Ubuntu/Linux)

PROFESSIONAL EXPERIENCE

Kathedra Summer Internship

Mechanical Engineering Intern | Brooklyn, NY | 07/2025 – 08/2025
• Redesigned a robotic staple-gun mounting assembly in SOLIDWORKS to reduce overengineering and improve structural stability
• Debugged Python ROS2 control scripts in Ubuntu to resolve corner-firing errors and improve precision
• Executed and analyzed 50+ trials in Linux Ubuntu to optimize stapling height, speed, and timing for improved process consistency

Holy Name Medical Center Internship

Engineering Intern | Jersey City, NJ | 08/2022 – 03/2023
• Developed hospital equipment energy and cost savings report while to support hospital's PSE&G $5M energy savings plan

LEADERSHIP AND INVOLVEMENT

Columbia FSAE Formula Racing — Controls Team

Low-Voltage Enclosures Lead Engineer | New York, NY | 07/2025 – Present
• Led the design of low-voltage electrical enclosures (NC Bob, TSAL, dashboard) for a Formula SAE race car using SOLIDWORKS
• Produced engineering drawings for the TSSI, dashboard, and terminal lock components to support fabrication and assembly
• Redesigned enclosure and mounting strategies to ensure waterproof sealing, structural integrity, and easy vehicle integration
• Designed and manufactured terminal locking components housed within the NC Bob using waterjet cutting
• Designed and tested O-ring sealing features through physical prototyping to validate waterproof performance
• Performed static FEA on reinforced dashboard mounting features to verify survivability under repeated driver-induced impact loads

Controls Team Member | New York, NY | 09/2024 – 07/2025
• Conducted FEA study in SOLIDWORKS on mounting tabs to verify load capacity and failure margins under and assembly loads
• Used CAD and FEA results to refine tab geometry and mounting features to reduce stress concentrations and risk of fracture
• Fabricated and installed vehicle components using CNC machining to supported integration of low-voltage systems

Columbia Space Initiative

Lunabotics Team Member – Autonomous Vehicle Project | New York, NY | 07/2025 – Present
• Designed mechanical layout and packaging for an autonomous lunar-style vehicle for the NASA Lunabotics challenge
• Integrated sensors, actuators, drivetrain components, and control enclosures into a cohesive vehicle architecture
• Supported system integration using dual Raspberry Pi controllers running Linux-based robotics software

RESEARCH EXPERIENCE

Columbia University Shared Materials and Characterization Laboratory

Research Technician | New York, NY | 09/2024 – 05/2025
• Supported semiconductor fabrication and characterization using SEM analysis, RIE, thin-film deposition, and ellipsometry
• Developed semiconductor devices in a cleanroom using SEM analysis, spin-coating silicon wafers and RIE