Alvaro Guerra

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Education

Texas A&M University College Station, TX
B.S. Mechanical Engineering *2021 - 2025*

Experience

Structures Lead 11-2024 – Current
IGNITORS (Rocketry Team) *College Station, TX*

- Delivered presentations on composite manufacturing, structural aspects of rocketry, and IREC competition strategies, aligning team tasks with project timelines to ensure efficient and informed progress toward mission goals
- Designed and fabricated composite-based rocket to an altitude of 12,000 feet

Structures and Material Science Designer 05-2022 – 04-2023
SAE Aero Design Team *College Station, TX*

- Secured 1st Place Finalist position at the SAE Aero West International Competition through aircraft design, topological optimization, and teamwork.
- Optimized airplane payload,58% of total weight, using SolidWorks and ANSYS, adjusting the center of gravity to be 9.5 inches aft of the main wing leading edge for CFD analysis

Garden Robot Developer 08-2024 – 05-2025
Garden Cultivation Capstone Project *College Station, TX*

- Capstone senior project to design, build, and test RC robot aimed at assisting individuals with physical disabilities in performing home gardening tasks with greater ease and independence
- Implemented Arduino code for robotic wheel movement, watering, fertilizing, and climate sensing for informed gardening actuation

Real Estate Analyst Intern 05-2021 – 08-2021
River Valley Appraisals of Texas, LLC *Edinburg, TX*

- Conducted residential property evaluations using regression analysis and comparable sales market data with excel data analysis

Projects

openLayup (Python) April 2025

- Developing an open-source structural simulation tool for rocket components, leveraging Python and APIs (Onshape, SolidWorks, Granta Ansys) for material property retrieval, geometry integration, and failure analysis
- Implemented failure mode analysis using Max Stress/Strain criteria, CLT, Tsai-Wu, Tsai-Hill, Hashin-Rotem, and Puck Criterion

BeamMeUpScotty (Python, Jupyter) April 2025

- 2D structural analysis tool that enables users to model, analyze, and visualize trusses and beams
- Implemented numerical methods for analytical estimation using Euler-Bernoulli, stiffness matrices, and Newton-Raphson techniques

Technical Skills

Software: SolidWorks, Onshape, ANSYS, Python, Matlab, HTML/CSS, Git, Microsoft Office
Manufacturing: 3D Printing (Prusa/Ender3), Hand Tools, CNC Machining, Manual Mill/Lathe
Libraries: pandas, NumPy, Matplotlib, beauitfulsoup, PyQT