Yunushan Gulsen

SECRET CLEARANCE

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EDUCATION

Rensselaer Polytechnic Institute (RPI) Troy, NY
B.S. in Aerospace Engineering May 2024
Relevant Coursework: Propulsion Systems (Rocket Engine Design, Nozzle Design, Combustion Analysis, Propellant Selection, Combustion Chambers, Turbines, Rocket Engines), Aerospace Structures & Materials (FEA, Structural Analysis, Vibrations, Composite Materials, Buckling Analysis), Structural Dynamics, Finite Element Analysis, Space Vehicle Design, CFD (Aerodynamic Loads), Thermodynamics, Fluid Mechanics, Control Systems, Linear Algebra.
Awards: Rensselaer Leadership Award, Rensselaer Medal Scholarship.

SKILLS

- **Design:** Siemens NX, SolidWorks, AutoCAD, CAD.
- **Fabrication:** Lathe, Drill Press, Mill, CNC Equipment, Band Saw.
- **OS:** Linux (Debian), Windows, MacOS.
- **Tools:** HyperWorks, Microsoft Office.
- **Design:** Siemens NX, SolidWorks, AutoCAD, CAD.
- **Programming:** MATLAB, Python.
- **Analysis:** FEA (Hand Calculations), CFD (Hyperworks), Structural Analysis, Dynamic Analysis, Vibration Analysis, Aerodynamic Analysis, Propulsion System Analysis, Delta-V Calculations, Control Systems Analysis, MathCad.

RELEVANT WORK EXPERIENCE

General Dynamics Electric Boat Groton, CT
Co-Op Engineer, Department 498 March 2023 - August 2023

- Managed engineering documentation (CNs, CRs, VIRs, VREQs) to facilitate design changes and resolve shipyard/vendor technical inquiries, ensuring alignment with project requirements and specifications.
- Spearheaded retrofit design and implementation for submarine components, ensuring design compliance with stringent MIL-SPEC safety and performance standards, and managing the engineering approval lifecycle.
- Validated structural integrity of submarine components via MathCAD analyses, performing shock force, stress, and material property calculations to ensure resilience under dynamic loads.
- Applied material science principles to component design and material selection, verifying material suitability based on corrosion resistance, mechanical properties, and performance requirements for demanding marine environments.

RPI Center for Flow Physics & Control Troy, NY
Undergraduate Research Assistant Fall 2021 - Spring 2022

- Conducted experimental wind tunnel testing to verify aerodynamic performance improvements of innovative active camber morphing helicopter rotor design.
- Optimized helicopter rotor designs using CAD modeling and data-driven iteration from wind tunnel testing, achieving a 50% reduction in component count while maintaining aerodynamic performance and structural integrity.
- Engineered a stress-tolerant airfoil attachment system hardware for wind tunnel models, enhancing aerodynamic measurement accuracy and ensuring reliable experimental data acquisition during hardware testing.
- Iteratively refined helicopter rotor hardware designs using a test data-driven iterative process, continuously improving structural performance and design robustness based on wind tunnel testing and material stress analysis.

CubeSat Propulsion System (Capstone) - Propulsion Lead Troy, NY
Propulsion Lead Fall 2023

- Designed and optimized a 0.54U CubeSat propulsion system, leading structural analysis and utilizing FEA to validate structural integrity and ensure design performance for a 101 m/s delta-V mission.
- Conducted Finite Element Analysis (FEA) using HyperWorks to evaluate structural integrity of CubeSat propulsion system components (tanks, mounts) under launch and operational loads, validating robustness against mission vibration profiles.
- Engineered a 0.54U CubeSat propulsion system within stringent volume and mass constraints, optimizing component selection and system integration to meet structural efficiency and performance requirements.
- Utilized MATLAB for propulsion system modeling and performance prediction, enabling delta-V calculations and informing design decisions for the CubeSat propulsion system.

PROJECTS

Lagrange Navigation Spring 2024

- Developed a Python-based solar sail trajectory simulation to validate navigation algorithms for Lagrange point station-keeping missions.
- Verified the implementation of a PD control system for solar sail trajectory control, utilizing Differential Evolution optimization.

Capybara CFD Spring 2024

- Conducted aerodynamic analysis using HyperWorks CFD software to virtually test and validate the aerodynamic properties of a novel 'capybara' geometry.
- Validated vortex wake patterns and pressure distribution characteristics through detailed analysis of HyperWorks CFD simulation data.