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Nicholas D. Walker

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EDUCATION

Rensselaer Polytechnic Institute (RPI) *Troy, NY 12180*
Bachelors of Science in Aerospace & Mechanical Engineering *Dual* Graduation May 2025
Economics Minor Academic Standing: Dean's List

EXPERIENCE

GE Vernova **Spring 2024**
Engineering Design Intern *Schenctady, NY*

- Successfully ran full-scale layout simulations on last-stage steam turbine buckets for multiple units using ANSYS, and synthesized results into frequency plots for vibrational and structural assessment
- Led root cause analyses of steam control valve failures, utilizing GD&T and NX to identify issues and develop solutions
- Validated previous ANSYS simulation results for prior models, ensuring compliance with standards and enhancing the reliability of design simulations
- Collaborated with different teams to optimize design parameters, contributing to improved performance for steam turbine components

Structural Damage Diagnostic Research **Fall 2023**
Undergraduate Researcher *RPI Walker Laboratory*

- Developed numerical models of damage parametrization and diagnostics under uncertainty in indicative UAV components outfitted with various sensing modalities, assessed under varying operating conditions
- Designed FEM/SEM damage diagnostic models for exploring various structural health monitoring (SHM) active approaches, with respect to damage state parametrization to represent damage propagation throughout structure
- Utilized ABAQUS for FEM to quantify the impact of different damage states (e.g., crack size) on component performance, monitoring changes in natural frequencies and vibrational modes to diagnose structural damages

PROJECTS

Europa Orbiter Design | *MATLAB, STK, Simulink* **Fall 2024**

- Design of a spacecraft using NX, MATLAB, and STK to orbit Europa, collect surface and atmospheric data, and relay information to Earth
- Developed a surface probe in NX and used Simulink for sampling, and communication with the orbiter

Autonomous Drone Simulation | *C++,* **Fall 2024**

- Designing and implementing a C++ simulation environment with control algorithms for real-time path planning to enable autonomous flight modeling and obstacle avoidance
- Integrated sensor data processing and feedback loops using numerical methods to analyze flight parameters

Yonka Rocket Design | *NX, NASTRAN, Python* **Spring - Summer 2023**

- Designed a carbon fiber rocket in NX, optimizing its structural integrity under dynamic loading using NASTRAN
- Incorporated launch parameters with NumPy and SciPy in Python, optimizing the body shape iteratively to reduce drag and improve flight stability
- Applied aerodynamic analysis to refine design based on performance metrics from simulations

Fil-A-Bot | *SolidWorks, Simulink, Python, Arduino* **Spring 2023**

- Collaborated with a team to create a device purposed with transforming plastic bottles into 3D printing filament through the use of a cutting system that would heat and shred bottles into smaller pieces
- Individual systems were designed in NX and SolidWorks; Shredding, melting, and filament extrusion processes were integrated in Simulink to view the system's performance and to ensure synchronization between each system
- An Arduino-based PID closed-loop control system regulated extrusion speed, maintaining specified tolerances

CFD Automotive Wing Analysis | *CFD* **Fall 2023**

- Developed a CFD model in Altair by applying appropriate boundary conditions and flow conditions to achieve accurate post-processing results
- Iterative testing through varying mesh refinements and simulation set-ups enhancing data quality

SKILLS (Most-to-Least used)

CAD/FEA/CFD: NX, NASTRAN**,** ANSYS, CATIA, SolidWorks, AutoCAD, Altair, CREO
Programming Languages: Python, MATLAB, Arduino, C++, HTML, CSS, JavaScript, NumPy, SciPy
Recent Coursework: Heat Transfer, Propulsion Systems, Aerostructures, Aeroelasticity & Vibrations, Space Vehicle Design, Aerodynamics, Engineering Dynamics, Finite Element Methods, Numerical Methods and Programming, Thermodynamics