Jacob Roller

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Objective Entry level mechanical engineering or avionics design position within the space industry.

Education

Worcester Polytechnic Institute (WPI), Worcester, MA 03/2023

- Bachelor of Science in Aerospace Engineering, Minor in Electrical Engineering
- GPA: 3.97/4.00
- Relevant Courses: Spacecraft and Mission Design, Rocket Propulsion, GNC, Fluid Dynamics, Structural Dynamics, Aerodynamics, Astronautics, Microelectronic Circuits, Digital Circuits

Work Experience

Embedded Systems Intern 05/2022 – 08/2022

Aurora Flight Sciences, Cambridge, MA

- Supported conceptual vehicle-level avionics development for Virgin Galactic mothership through interface definition, drawing creation & revision, library modeling, and electromechanical design.
- Tested and calibrated Lunar Gateway HALO pressure relief valve ground support equipment.

Processing Technology Intern 06/2021 – 08/2021

Saint-Gobain Research, Northborough, MA

- Developed novel manufacturing processes for high-precision ceramics and turbine blades.
- Designed and implemented a high-speed camera system to observe process phenomena.
- Characterized and improved ceramic slurry formulations using SEM, and rheology.

Skills

Engineering Software: SolidWorks, CATIA, Fusion 360, ESPRIT, EAGLE, Capital, Visio, Multisim

Manufacturing: CNC milling and turning, FDM/SLA 3D printing, EDM, Electronics fabrication

Programming: MATLAB, Python, Arduino (C), Verilog, Java, C++, HTML, CSS, Mathematica

Technical Documentation: Microsoft Office, Microsoft Visio, LaTeX

Project Experience

WPI High Power Rocketry Club 08/2019 – Present

- Leading a team of 50 students as Payload Division lead to design, document, and manufacture a folding-arm cubesat quadcopter to deploy weather station sensor packages for WPI's 2022-23 Spaceport America Cup launch vehicle.
- Led a team of 30 students as Payload Division Lead to create a rocket-deployed folding-arm quadcopter to complete autonomous search and rescue mission for WPI's 2021–22 Spaceport America Cup launch vehicle.
- Led a team to design, document, and manufacture robotic self-righting and stabilization systems for WPI's 2020–21 USLI autonomous lander payload.
- CAD, manufacturing, and integration of payload systems for WPI's 2019-20 USLI rocket.

WPI Model Rocketry Club 08/2019 – Present

- Leading peers to design, manufacture, and fly high-power rockets for NAR certifications.
- Designed and manufactured a high-power rocket to obtain NAR Level 1 and 2 certifications.

Advanced Manufacturing Research 01/2021 – 06/2021

- Developed Python and MATLAB scripts to simulate loose abrasive grinding processes using FEM.

Schlieren Imaging 05/2018 – 04/2020

- Applied properties of mirror-based Schlieren photography to visualize optical density and refractive index gradients through photo and video.