Priscilla Pak

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Propulsion engineer with hands-on experience designing, analyzing, and testing rocket engine combustion device hardware. Proven track record owning hardware from concept through production-ready designs with a focus on performance optimization and manufacturability. Experience in CFD, FEA, and CAD. Secret clearance active.

Work Experience

Propulsion Engineer   Oct 2020 - Mar 2024 | *Rocket Propulsion Student Group, Boston University | Boston, MA*
- Optimized triplet injector design for manufacturability for a 2,500 lbf liquid bipropellant rocket engine, reducing cost by 60%; performed FEA thermal analysis in SolidWorks for engine temperatures at 3,000°F.
- Executed test operations on prototypes to validate analysis within 10% of the test data; performed safety assessments and operated pressurized test hardware during cold flow testing.
- Reduced the mass of the avionics bay assembly by 20% vs. the initial design after evaluating 5 structural configurations through trade studies and thermal/structural FEA.
- Produced mechanical drawings and manufactured critical components by GD&T standards per ASME Y14.5.
- Led a cross-functional team of 7 engineers, coordinating with structures and avionics subteams.

Propulsion Systems Intern   Jun 2023 - Aug 2023 | *Group 74, MIT Lincoln Laboratory | Lexington, MA*
- Performed 50+ CFD aerothermal fluid flow simulations on hypersonic flight vehicles using Kestrel; generated unstructured meshes to resolve heating over complex 3D geometries; validated predictions within 15% of benchmark test data.
- Optimized thermal model fidelity through 4 parametric trade studies across mesh density and solver parameters.
- Developed Python automation workflows that reduced mesh generation and post-processing time from 5 hours to 2 hours per case.

Graduate Research Assistant   Sep 2024 - Jun 2025 | *Reactive Flow Modeling Lab, The University of Texas at Austin | Austin, TX*
- Developed combustor models using Direct Numerical Simulation (DNS) of ammonia flames on HPC clusters and validated against experimental data, achieving prediction accuracy within 10% for 15+ operating conditions.
- Improved simulation accuracy by 10% through systematic comparison of 5 ammonia combustion kinetics mechanisms against experimental flame speed measurements.
- Automated CFD post-processing and validation workflows with Python scripts, reducing data analysis time from 8 hours to 2.5 hours per case.

Manufacturing Lab Assistant   Sep 2021 – May 2022 | *Engineering Product Innovation Center, Boston University | Boston, MA*
- Machined engineering components using equipment such as lathes, mills, cutters, and drill presses.
- Trained and provided technical support to 100+ engineering students on machining techniques, design-for-manufacturing principles, and equipment calibration.

Aerospace Engineer   Sep 2021 - Mar 2023 | *Space Physics and Technology Lab, Boston University | Boston, MA*
- Performed hardware integration and design optimization for the LEXI telescope mass model.
- Executed ground station operations for CuPID CubeSat, managing uplink protocols and satellite tracking using a custom Yagi antenna deployed in Fairbanks, AK.

Education

Master of Science, Aerospace Engineering | The University of Texas at Austin
Sep 2024 - Dec 2025 | Thrust 2000 Graduate Fellowship | Provost's Graduate Excellence Fellowship

Bachelor of Science, Mechanical Engineering | Boston University
Sep 2020 - May 2024 | Richard D. Cohen Scholarship

Technical Skills

Design: SolidWorks, GD&T, ANSYS, design for manufacturing (DFM) principles
Analysis: ANSYS Fluent, COMSOL, Kestrel, OpenFOAM, Tecplot, Pointwise, Paraview, DNS, combustion modeling, Cantera
Programming: Python, MATLAB, C++, Julia, Bash scripting, Excel
Manufacturing: Manual and CNC machining (mills, lathes), additive manufacturing
Fundamentals: Thermodynamics, Fluid Dynamics, Heat Transfer, Propulsion Systems, Structural Analysis