Sean Bowman

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SUMMARY

Propulsion Design Engineer and Software Lead with expertise in architecting enterprise engineering software and designing orbital-class hybrid rocket hardware. Specializes in regeneratively-cooled nozzle design, thermo-fluid analysis, and leading development teams building integrated propulsion component models spanning engines, nozzles, injectors, and turbopumps.

EXPERIENCE

Aerospace Engineer II: Fluid Thermal Control — **Vaya Space**
April, 2022 – Present — *Cocoa, FL*

- Originated and architected enterprise propulsion design suite comprising 38,000+ lines of Python across 8 major tool classes including Engine, Nozzle, Tank, Injector, Volute, Fuel Grain, Turbopump, and a collection of generalized utilities supported by 100+ technical documentation files
- Lead 6 contributing developers through mandatory code reviews; authored coding standards, onboarding documentation, and Git workflow with main/dev/feature branching and quarterly production releases
- Developed 16,000+-line nozzle design module (∼40% of codebase) featuring Axisymmetric Method of Characteristics (AxMoC) for isentropic contour generation with exit pressure-matching contour truncation methodology and optional optimizations for length fraction
- Built regenerative cooling design framework with REFPROP/CEA integration for coolant and exhaust properties; performs conjugate heat transfer analysis and generates full 3D channel geometry of variable cross section type intended for additive manufacturing via LPBF
- Created multi-user frontend infrastructure for internal engineering team use with priority-based CPU allocation, background job processing with live progress streaming, and session management with automatic resource cleanup
- Design suite generates CAD-ready outputs including .STL/.3MF exports, 3D-printability audits with overhang analysis, FEA-ready property exports, and GRCop-42 copper alloy material integration
- Serve as responsible engineer through nozzle hardware lifecycle: test planning, DFM reviews, control room operations, post-test data analysis, and certification documentation

Graduate Research Assistant — **Florida Institute of Technology**
Spring 2021 – Fall 2021 — *Melbourne, FL*

- Performed advanced DPM CFD simulation of cryogenic droplet thermo-fluid mixing for rocket propulsion system; achieved <5% deviation from experimental benchmarks
- Delivered validated analysis tool to leading rocket manufacturer; analysis article currently in active use

Graduate Teaching Assistant Lead — **Florida Institute of Technology**
January 2019 – May 2021 — *Melbourne, FL*

- Created course materials and lectured for AEE 3064 Fluid Mechanics Laboratory; oversaw team of instructors conducting weekly progress meetings

R&D Engineer Intern — **Airborne Systems**
June 2017 – August 2017 — *Pennsauken, NJ*

- Designed hardware using SolidWorks for heavy payload airdrop system; facilitated instrumentation control for payload drops at Arizona test event

TECHNICAL SKILLS

Programming: Python, MATLAB, C++, Javascript, HTML, FORTRAN, VBS, Git

Engineering Tools: Siemans NX, Simcenter Nastran, Atlassian Products (Jira, Confluence, Bitbucket), SolidWorks, ANSYS Fluent, LaTeX, REFPROP, CEA, GFSSP

Process: Code Review, Technical Documentation, Test Planning, Risk Assessment, Design for Manufacturability

EDUCATION

Master of Science in Aerospace Engineering — December 2021
Florida Institute of Technology — Melbourne, FL

Bachelor of Science in Applied Physics, Minor: Mathematics — December 2017
Stockton University – Magna Cum Laude — Galloway, NJ