Brian Yue

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Professional Summary

Mechanical design of aircraft hardware: detail design, engineering drawings and GD&T, tolerance analysis, structural validation, and hands-on fabrication and assembly.

Education

Duke University, Durham, NC *Expected May 2028*

B.S.E., Mechanical Engineering; Certificate in Aerospace Engineering

Cumulative GPA: 3.776/4.000

Relevant coursework: Solid Mechanics (Mechanics of Materials), Structure & Properties of Solids, Dynamics, Thermodynamics

In progress: Fluid Mechanics, ME Analysis & Design, Aircraft Propulsion

Teaching Assistantships: EGR 105 (2 years), ME 221 (1 year)

Experience

Research Intern, Turbulent Shear Flow Laboratory *June 2026 – August 2026*

NC State University, Dept. of Mechanical and Aerospace Engineering, Raleigh, NC – Advisor: Dr. Venkat Narayanaswamy

- Designed a floating-element shear-force balance to fit inside a tightly constrained subsonic wind tunnel.
- Produced manufacturing drawings with ASME B4.1 fit classes, Y14.5 datum-referenced positional tolerances, and surface finish callouts, selecting tolerances by weighing shop capability against instrument requirements.
- Constrained the element in five degrees of freedom, isolating shear to a single load path through a uniaxial load cell.
- Rerouted the load path onto a ~$159 COTS ball-bearing carriage-and-rail system after test data from a comparable instrument showed friction eroding ~40% of measured shear force.
- Modeled the assembly in Onshape and validated structural performance under test loads with SolidWorks FEA.
- Built the assembly around COTS hardware and produced a bill of materials with vendor part numbers and unit costs.

Student Researcher *April 2025 – June 2026*

Duke University, Dept. of Mechanical Engineering, Durham, NC – Advisor: Dr. Earl H. Dowell

- First-author literature review synthesizing 53 sources on transonic truss-braced wing technology; spanned aerodynamics, structures, aeroelasticity, computational modeling, and systems integration; presented at the 2026 AIAA Aviation Forum.

Projects

Unified Forward Closure Design *August 2025 – present*

Duke Aero, Solid Propulsion Subteam, Durham, NC

- Drove the redesign of Duke Aero's solid rocket motor forward closure, consolidating hydrostatic test, static hot fire, and flight closures into a single component to reduce part count by 67% and eliminate two machining setups.
- Modeled the design in Onshape and SolidWorks; applied FEA to validate structural performance under flight conditions.
- Evaluated commercial fastener and sealing configurations against specified combustion chamber thermal and mechanical loads to reduce manufacturing complexity.
- Machined forward closure components using a lathe, drill press, and mill.

Accessible PlaySeat *September 2024 – December 2024*

Duke University, Durham, NC

- Designed a custom adaptive seating structure on a 4-person team over an 11-week build cycle, translating a young client's postural and reach limitations into quantified requirements.
- Moved the drive wheels forward after a fit test showed that he could not reach the push rims and added rear wheels to offset the shift in center of gravity.

Publications

- Yue, B., "An Overview of Transonic Truss-Braced Wing Technology," *Proceedings of the 2026 AIAA AVIATION Forum*, San Diego, CA, June 8–12, 2026, AIAA Paper No. 2026-4344. https://doi.org/10.2514/6.2026-4344.

Honors and Awards

- Bellman Gift Travel Grant ($1,747), Dept. of Mechanical Engineering and Materials Science, Duke University – 2026
- International Space Settlement Design Competition – Team Captain & Global Champion, 2023; Student Advisor, 2024.

Technical Skills

- **CAD & Design:** SolidWorks, Onshape, GD&T (datum reference frames, positional tolerancing, surface finish callouts), design for manufacturability/assembly, engineering drawings, bill of materials
- **Analysis:** SolidWorks Simulation (finite element analysis), hand calculations, tolerance analysis, load path analysis, instrumentation & measurement system design, ANSYS Granta EduPack
- **Fabrication & Prototyping:** Manual machining (lathe, drill press, band saw), CNC machining (5-axis, WEDM), laser cutting, additive manufacturing (additive friction stir deposition, 3D printing), component assembly, load cell integration
- **Computer Skills:** Python (NumPy, Matplotlib), Microsoft Office Suite
- **Languages & Certifications:** English (native), Mandarin Chinese (native, written translation); Pratt Student Shop (Duke)