# HAN ZHENG

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## EDUCATION

**Johns Hopkins University** Baltimore, MD
*Bachelor of Science* Expected June 2026

- Mechanical Engineering (Aerospace Track)
- GPA: 3.78

## SKILLS

**Design & Manufacturing:** SolidWorks, Creo, Onshape, GD&T, CNC Machining, 3D Printing, Composites Manufacturing
**Simulation & Analysis:** Abaqus, ANSYS (Mechanical, CFX, Fluent, Granta), Creo Simulate, SimScale, Micro-CT
**Electronics, Programming & Tools:** C/C++, Arduino IDE, MATLAB, Circuit Analysis & Implementation, Microsoft Office Suite

## EXPERIENCE

**Chief Engineer** Baltimore, MD
Johns Hopkins University - Design/Build/Fly (DBF) September 2023 - Present

- Leading design and fabrication of a full carbon-fiber aircraft using wet layup techniques for the 2026 DBF competition
- Simulated a 2-ft hard-landing scenario on a composite fuselage structure using ANSYS Explicit Dynamics, identified high-stressed regions in the fuselage skin, and applied localized reinforcement through additional carbon-fiber plies
- Completed an aerodynamic trade study using ANSYS CFX to evaluate landing gear wheel fairings, validating a 5% reduction in drag that outweighed the induced-drag penalty from the added weight of the fairings
- Designed and integrated an empennage with a steerable, rudder-linked tail gear providing ±30° rotation using Onshape
- Performed structural analysis on the aircraft wing using a self-developed MATLAB-based beam analysis tool to optimize fuel tank placement, reducing maximum bending moment by 16%
- Conducted CFD simulations in SimScale for the aircraft payload at angles of attack from 4°-16° at 20 mph airflow, analyzing flow patterns around pylons to improve aerodynamic performance

**Mechanical Engineering R&T Intern** Rochester, NH
Albany Engineered Composites June 2025 - August 2025

- Researched the relationship between fiber crimp and the elastic properties of 3D-woven composites, observing a moderate linear correlation ($R^2 \approx 0.66$) in which higher crimp was associated with lower in-plane moduli
- Devised and conducted experiments to characterize friction in woven preforms across varying temperatures, moisture levels, and weaving architectures, revealing how friction influences compaction behavior and fiber-buckling tendencies
- Developed a Fortran subroutine linking strain and modulus from test data, enabling Abaqus simulation of a micro-CT–compatible preform compaction fixture to assess stress and deflection under compaction loads
- Designed a fixture for securing woven preforms during micro-CT scanning in SolidWorks and 3D-printed it in ABS, replacing the previous foam fixture that allowed sample movements and compromised scan quality

**Mission Collaborator - Team VfOx, DAVINCI Mission** Baltimore, MD
Johns Hopkins University September 2024 - December 2024

- Identified optimal placement for the Venus Oxygen Fugacity (VfOx) sensor on the mission probe using COMSOL Multiphysics flow simulations at descent speeds of 20 and 30 m/s, ensuring fresh airflow over the sensor
- Quantified risk levels of VfOx accommodations using 5×5 matrices and presented final recommendations and trade study results to engineers from NASA Goddard Space Flight Center (GSFC) and Johns Hopkins Applied Physics Laboratory (APL)

## ADDITIONAL POSITIONS HELD

**Fabrication Engineer** Baltimore, MD
Johns Hopkins University Whiting School of Engineering September 2024 - December 2024

- Created detailed process sheets for manufacturing Stirling engine components (flywheel, piston housing, base plate) from CAD drawings, incorporating GD&T to define tolerances for each manufacturing step
- Operated lathe, mill, and other tools to fabricate a Stirling engine running at approximately 200 rpm

**Research Assistant** Baltimore, MD
Fluid Transport Lab September 2023 - August 2024

- Engineered grid plates with filleted square holes ranging from 6×6 cm to 16×16 cm to vary turbulence intensity for studying how fish schools respond to eddies of different length and time scales
- Coauthored the user manual for a Python package built for 3D Lagrangian particle tracking