

Nishanth Kunchala

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EDUCATION

The Ohio State University, College of Engineering

05/2026

- B.S. Aerospace Engineering, Minor in German – GPA: 3.9/4.0
- Relevant Courses: Astronautics, Heat Transfer, Principles of Propulsion, Hypersonic Flow, Computational Fluid Dynamics

EXPERIENCE

NASA Glenn Research Center Internship

06/2024 – Present

Aircraft Design and Optimization in Aviary:

- Improved Aviary’s utility for Design–Build–Fly teams by introducing **small-scale UAV conceptual design** capabilities—previously unavailable—through custom mass and geometry subsystems, as well as **CFD mesh generation and visualization via OpenVSP**.
- Developed an analytical structural mass and geometry subsystem with OpenVSP integration, **achieving mass estimates within 2.5% of actual values** while minimizing required inputs to enable more accurate results and streamlined optimization workflows.
- Built trajectory optimization workflows in Dymos and OpenMDAO to generate optimal aircraft designs, **increasing mission range by 21%**, through collaboration with propulsion and aerodynamic teams, to minimize mass and power consumed, while optimizing lift.

NASA Human Lander Challenge (HuLC)

01/2024 – 06/2024

AI & CFD Lead:

- Programmed a 3D keypoint detection multi-headed neural network for in orbit alignment, using tensorflow, achieving **12 ms inference speed on a 10,000-image dataset** by designing procedures for data collection, preprocessing, training, and optimization.
- Engineered and programmed a 6-DOF Stewart platform for autonomous coupling, achieving **sub-millimeter positioning accuracy** by integrating 3D printing, **AprilTag and AI based computer vision**, linear actuators, and a custom **Arduino-based control loop**.
- Validated microgravity cryogenic fuel transfer models, using ANSYS Fluent CFD to inform CAD-based geometry optimization, **reducing mass flow rate loss to 0.24%**, coauthoring a technical paper and presenting our work at the **2025 NASA HuLC Conference**.

Buckeye Space Launch Initiative

08/2022 – Present

Airbrakes Responsible Engineer:

- Led and mentored the Airbrakes sub-team, **validating structural integrity**, testing stepper/servo motors for torque and responsiveness, **training members through 25+ lessons**, involving hands-on learning, experimental testing, and collaborative programming.
- Developed and implemented a real-time control system for a dynamic airbrake system, achieving **within 1% apogee prediction in the subsonic regime** by fusing sensor data with a Kalman Filter, integrated into a physics-based apogee prediction algorithm.

RESEARCH

OSU Aerospace Research Center (ARC) Drone Research

12/2024 – Present

- Developed and optimized a novel Context-Aware Centralized Copy-Paste Data Augmentation (C.A.CCPDA) pipeline, **increasing usable wildfire dataset size by 20×** and enabling robust wildfire segmentation under data scarcity, allowing for AI model training.
- Achieved a U-Net segmentation **accuracy boost from 40% to 97%**, through extensive hyperparameter tuning and cross-validation on a **400 million sample, 4-class wildfire dataset**, utilizing a custom loss-function informed by firefighter response priorities.
- Engineered a fire cluster pasting algorithm using contextual environmental statistics and semantic region similarity, **reducing Fire false negative rate (FNR) by 26.6%** on real-world data, coauthoring publications submitted to **IEEE TGRS** and **AIAA SciTech**.

SKILLS

Programming Languages: Python, MATLAB, Java, C, LaTeX
Simulation: OpenMDAO, Dymos, ANSYS Fluent, Simulink
Machine Learning & AI Tools: TensorFlow, JAX, Jupyter

CAD & Design: SOLIDWORKS, OpenVSP, Onshape
Fabrication & Hardware: CNC, Composite Layups
Version Control & Tools: Git, Overleaf, Microsoft Office

CERTIFICATIONS

- CEFR-Level B2 German Language Certification 06/2024
- PCEP – Certified Entry-Level Python Programming 04/2024

AWARDS

- Awarded Best Prototype at NASA’s HuLC Finalist Conference 2025
- Awarded \$9,250 in prototype funding in NASA’s HuLC Competition 2025
- 3rd Place, OSU HackAI Hackathon 2025
- 2nd Place OSU Society for Women in Engineering Integral Bowl 2024
- 2nd Place, Ohio State Engineering FYE Design Showcase 2023
- Eagle Scout, Boy Scouts of America 2022