Ayush Karkare

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Education

Purdue University *West Lafayette, IN*
Bachelor of Science in Aeronautical and Astronautical Engineering ***May 2027 (Expected)***
Minors/Certificates: Economics, Certificate in Entrepreneurship and Innovation GPA: 3.75 / 4.00
Dean's List and Semester Honors
***Relevant Coursework*:** C Programming, Intro to Aero Design, Thermodynamics I, Aeromechanics I, Aeromechanics II

Experiences

The Boeing Company *Edwards Air Force Base, CA*
Flight Test Engineering Intern ***June 2025 – Present***

- Collaborate with the B-1B instrumentation team to design avionics components for flight tests and support the B-52 radar modernization project by assisting with system development and integration
- Analyze electrical and mechanical drawings and utilize redlined documents to write Test and Evaluation Work Sheets (TEWS), documenting necessary work orders for subassemblies in larger projects
- Actively sought learning opportunities by touring various platforms, including the C-17, to understand the procedures of multiple teams and build valuable connections within the company

Purdue Aerial Robotics Team *West Lafayette, IN*
Airframe Competition Lead ***August 2024 - Present***

- Spearheaded the design and optimization of UAV components using Siemens NX, FEA, and CFD simulations, ensuring peak aerodynamic efficiency and structural integrity for competition readiness
- Manufactured and assembled UAV structures using carbon fiber layups for fuselage, wings, and ailerons, ensuring precision within tolerance to maintain structural integrity and proper load distribution
- Optimized manufacturing processes by 3D printing UAV ribs with aerospace filaments instead of carbon fiber layups, reducing complexity and weight, while maintaining structural integrity

Scope Consulting *West Lafayette, IN*
Technical Consultant ***December 2024 - Present***

- Developed a multi-input neural network for an applicant tracking system used internally, achieving 86% accuracy in candidate classification through structured data preprocessing (normalization, encoding) and unstructured text processing (tokenization, TF-IDF), significantly streamlining recruiting cycles
- Engineered a data integration pipeline that combined structured and unstructured data, optimizing model validation with gradient descent and reducing overfitting, resulting in a more efficient and scalable applicant tracking system

Design Projects

UAV Launch and Recovery System ***December 2024 - Present***

- Prototyped a high-performance UAV airframe using design tools to optimize aerodynamic efficiency and structural durability through iterative design processes, incorporating CFD (STAR CCM+) and FEA for validation
- Formulated and implemented a rail-based launch system and bungee-assisted recovery mechanism, utilizing 3D printing for prototyping, real-world testing for performance verification, and ArduPilot integration for precise control and telemetry analysis

Electric Bike Conversion Project ***June 2024 - December 2024***

- Designed and modeled a custom housing and motor assembly for an electric bike conversion with Siemens NX, incorporating Commercial Off the Shelf (COTS) parts from McMaster-Carr to ensure compatibility and streamline assembly
- Conducted load and vibration testing on 3D-printed components to evaluate fit and durability with the bike's existing frame and mechanical systems, iteratively refining the design based on test results
- Integrated electrical components through the VESC tool, configuring and programming the motor controller to achieve optimal performance and reliability, demonstrating a hands-on approach to electrical engineering principles

Thermodynamics Property Calculator ***November 2024***

- Engineered a MATLAB-based thermodynamics calculator with MATLAB App Designer, enhancing tabulation efficiency with optimized interpolation algorithms and an intuitive interface
- Developed a React and Flask web application using the Pandas Python library for real time thermodynamic calculations, supporting property and state determinations

Awards/Certifications

- Eagle Scout (Class of 2020), Entry-Level Coding in Python, 2x JMEC Startup Award

Skills

- Fusion 360, Autodesk Inventor, Siemens NX, C++, Microsoft Office, PowerBI, Arduino IDE, Python, MATLAB, 3D Printing, SolidWorks, ArduPilot, STAR CCM+, XFLR5, Teamcenter PLM