Karki Anurag

Cincinnati, Ohio, USA

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Summary

- Strong foundation in Finite Element Analysis (FEA) for structural, modal, and thermal simulations
- Skilled in Python, MATLAB, ROS2, and microcontroller integration for intelligent system design
- Experienced in collaborative projects applying neural networks, SOMs, and regression models
- Proficient in 3D modeling, simulation workflows, and CAD-to-physical prototyping

Education

University of Cincinnati — Cincinnati, Ohio

MS in Mechanical Engineering — Aug 2024 - Apr 2026

- Fall 2024 student
- Courses taken: Decision Engineering, Industrial AI, Intelligent System , Robot Control and design

Tribhuvan University — Lalitpur, Nepal

Bachelor in Mechanical Engineering — Nov 2017 - July 2022

- Elective Courses taken: Advance Mechanical Design, Mechanical Design & Simulation, Operation Research

Work Experience

National Innovation Center Nepal — Kathmandu, Nepal

Mechanical Engineer — Nov 2022 - Jan 2024

- Designing 3D CAD models and assemblies of VTOL drones using SolidWorks
- Performing Finite Element Analysis (FEA) using ANSYS to evaluate structural integrity of UAV frames
- Conducting modal and thermal simulations to assess in-flight vibration and thermal management performance
- Leading end-to-end UAV prototyping using 3D printing, laser cutting, and carbon-fiber layups for functional testing
- Collaborating with electronics and AI teams to integrate sensors, avionics, and battery modules into airframes

Incubation, Innovation, and Entrepreneurship Center (IIEC) — Lalitpur, Nepal

Mechanical Engineer — Jul 2022 - Nov 2022

- Designing modular UAV components for rapid prototyping and iteration
- Modeling UAV frame structures and sensor payload mounts in SolidWorks for use in Software-in-the-Loop (SITL) and Hardware-in-the-Loop (HITL) environments
- Assisting with ROS-based test flights for navigation stack validation in simulated and physical environments

Design Projects

Shape Optimization of Blended Wing Body Vehicle — Lalitpur, Nepal

Pulchowk campus, Tribhuvan University — Jan 2021 - Feb 2022

- Conducted both aerodynamic and stability analysis of a blended-wing body (BWB) vehicle
- Optimized the shape of the planform with 23% increase in aerodynamic efficiency

Shape Optimization of Convergent-divergent Nozzle for Maximum Thrust Using SU2 — Lalitpur, Nepal

Pulchowk campus, Tribhuvan University — May 2021 - Jul 2021

- Performed CFD analysis on 2D nozzle using SU2 software
- Thrust of a supersonic converging-diverging nozzle was optimized by using SU2 software

Design and fabrication of Long endurance Unmanned aerial vehicle (UAV) Lalitpur, Nepal
Pulchowk campus, Tribhuvan University Jul 2020 - Nov 2020

- Implemented iterative design process to come to a final design selection
- CAD modeled the entire vehicle
- Fabricated parts using 3D-printer, laser-cutter

Robotics and Automation Projects

Industrial Spray-Painting Robot Workcell Design Cincinnati, USA
University of Cincinnati Oct 2024 - Dec 2024

- Designed and simulated a robotic cell using ABB RobotStudio for automated spray painting of car doors
- Achieved 300% improvement in productivity with a 30-second painting cycle vs. 2 minutes manual time
- Developed AHP-based robot selection matrix and conducted cost-benefit analysis yielding <3 year ROI
- Integrated safety (light curtains), motion sensors, and real-time flow control for paint uniformity

Genetic Algorithm-based UAV Path Planning for Wildlife Monitoring Cincinnati, USA
University of Cincinnati Oct 2024 - Mar 2025

- Developed an automated path planning system for UAVs using a Genetic Algorithm approach
- Optimized flight paths to maximize the probability of wildlife detection
- Achieved improved performance compared to existing path planning methods

Design and Testing of Decision Support Mechanism Lalitpur, Nepal
Pulchowk campus, Tribhuvan University Jan 2021 - Feb 2022

- Designed a data acquisition system using Arduino and sensors
- DAS was attached to UAV and communicated using telemetry to ground station
- Decision support mechanism was built using DAS

Skills

Design skills	Solidworks, XFLR5, OpenVSP
Programming skills	Python , MATLAB, ROS2
Computational skills	ANSYS, SU2, SIMULINK
Miscellaneous skills	Linux, Latex, MS Office.

Publications

Research papers

A Genetic Algorithm Approach to Persistent UAV Surveillance in Probability-Guided Wildlife Monitoring
Anurag Karki, Hem Raj Pandeya, Niraj Prasad Bhatta
An International Journal of Computing and Informatics, 2025

Aerodynamic Shape Optimization of Blended Wing Body Planform
Anurag Karki, Hem P Pandeya, Sudip Bhattrai, Abhishek Karn, Aakash Sarraf
14th IOE Graduate Conference, 2023, Lalitpur, Nepal