

Aashutosh Aman Mishra

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Summary

Highly motivated aerospace engineer with a strong background in aircraft sizing, flight dynamics, flight simulation modeling, and aircraft stability and control.

Areas of Specialization

Aircraft design; Flight dynamic model for fixed-wing and rotorcraft; Aerodynamic model development; Flight test data processing and calibration; Aircraft stability and control; Fly-by-wire control law setup; 6-DOF non-linear piloted/auto flight simulation model development.

Education

PhD Candidate, Aerospace Engineering, Auburn University May 2025
An Integrated Methodology for Vehicle Design Subject to Flying Qualities Constraints.
GPA: 4.00

M.Sc. Aerospace Engineering, Auburn University May 2023
GPA: 4.00

B.E., Mechanical Engineering, Tribhuvan University, Nepal November 2017
GPA: 3.30

Project Experience

Ph.D. Candidate and Researcher 2019 – Present
Auburn University, Auburn, AL

1. Parametric Energy-Based Aircraft Configuration Evaluator (PEACE)

- Developed generalized tools for rapid vehicle design, aircraft sizing, and real-time flight simulation for conventional as well as novel advanced air mobility configurations, including fuel-burning, all-electric, and hybrid-electric aircraft.
- Automated and streamlined aerodynamic setup (including CFD based workflow) within the aircraft sizing and flight simulation framework in an optimal way to support real-time flight simulation.
- Implemented a strip-theory based modeling approach to tackle coupled aero-propulsive interactions and validated it with CFD-generated as well as wind tunnel results.
- Integrated aircraft longitudinal and lateral-directional flight dynamic characteristics, based on a fully nonlinear 6-DOF flight simulation model to meet the handling qualities guidelines defined by MIL-STD-1797A and MIL-F-8785C during vehicle sizing.
- Developed tail sizing approach for fixed-wing (as well as eVTOL vehicles) based on the stability and control (S&C) requirements at different flight conditions as defined in 14CFR Part 23 to ensure desirable flight characteristics after the vehicle has been sized.

2. Flight Simulation-Driven Research into Simplified Vehicle Operations for Urban Air Mobility (funded by FAA)

- Lead the development, integration, and validation of aero-propulsive characteristics for novel eVTOL designs into the research flight simulators driven by a MATLAB/Simulink-based non-linear time domain simulation framework.
- Gained hands-on experience with flight simulator construction, flight control system development, cockpit displays and control setup, control loading box modeling, visualization setup, and model calibration, to facilitate flight simulator operation.
- Integrated in-house flight dynamic models (developed in MATLAB) and aircraft configuration files into the environment of FlightGear and X-Plane for visual references in the flight simulator.

3. Modular Generalized Framework for Assessing Aircraft Aero-Propulsive, Stability, and Control Characteristics (funded by NASA LaRC)

- Developed tools to assess and evaluate stability and control characteristics of unconventional aircraft configurations during the early design stage.
- The project resulted in an aircraft control system simulation platform that is used to trim (by solving the constrained numerical optimization problem), assess stability/control, and eventually drive the research flight simulators in real-time.

Teaching Experience

Graduate Teaching Assistant (GTA)

2019 – 2020

- Tutor aircraft design tools like OpenVSP, XFOIL, QMIL/QPROP, and CFD (FlightStream®) to the aircraft design class.

Skills

- **Software:** MATLAB/Simulink, Python, C++, OpenVSP, FlightStream, XFOIL, AVL, XROTOR, SolidWorks, Git.
- **Technical:** Flight simulator visual setup using warp and blend, control loading systems, mechanical workshop experience, 3D-printing, data processing, and documentation.

Awards and Achievements

- AIAA Orville and Wilbur Wright Graduate Award (2024)
- AIAA Luis de Florez Graduate Award in Flight Simulation (2022)
- AIAA Electrified Aircraft Technology Best Paper Award (2022)
- AIAA Aircraft Design Best Paper Award (2021)

Select Publications ([Google Scholar](#))

- Mishra, A.A., et al., “Sizing and analysis of a lift-plus-cruise aircraft with electrified propulsion,” *Journal of Aircraft*, 2022.
- Mishra, A.A., et al., “Generalized energy-based flight vehicle sizing and performance analysis methodology,” *Journal of Aircraft*, 2021.