Anika E. Chawla

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EDUCATION

Georgia Institute of Technology, Atlanta, GA *August 2025 – May 2026 (expected)*
Master of Science in Aerospace Engineering

Georgia Institute of Technology, Atlanta, GA *August 2021 – May 2025*
Bachelor of Science in Aerospace Engineering · Minor in Computing & Intelligence GPA: 3.76

RESEARCH EXPERIENCE

Graduate Research Assistant – FAA CLEEN ASCENT Project
Aerospace Systems Design Laboratory, Georgia Tech
Advisor: Dr. Jimmy Tai *Fall 2025 – Present*

- Evaluated technology readiness and integration pathways for novel aerospace technologies, examining how adoption timelines and system compatibility influence long-term sustainability outcomes
- Conducted engine cycle and system-level analyses using EDS, FLOPS, and Python-based post-processing to quantify fuel burn, noise, and emissions impacts under varying modeling and policy assumptions
- Performed fleet-level scenario analyses incorporating aircraft turnover rates and heterogeneous technology adoption to assess robustness of environmental outcomes under uncertainty

Wireless Energy from Beamed Signals (WEBS) CubeSat Development
Space Systems Design Laboratory, Georgia Tech
Advisor: Prof. Brian Gunter *Fall 2024*

- Optimized edge-detection and feature-extraction pipelines from infrared camera outputs using OpenCV, affine transformations, and moment invariants to ensure robust classification under image distortion
- Developed image reconstruction and validation algorithms using flux and streak analysis, benchmarking against known starfields to verify orientation accuracy

Model-Based Systems Engineering Using SysML
Aerospace Systems Design Laboratory, Georgia Tech
Advisors: Prof. Dimitri Mavris, Dr. Selcuk Cimtalay *Fall 2022 – Spring 2024*

- Modeled lifecycle architectures of complex aerospace systems using SysML, enabling traceability, impact analysis, and system-level trade studies
- Created propulsion-system design tooling to support early-stage architectural decisions and validated outputs using flow characterization

WORK EXPERIENCE

Pratt & Whitney (RTX) - AeroThermal Fluids Intern: Systems Optimization
Advanced Concepts and Technology *May 2024 – August 2024*

- Developed AI-based analytics tools to identify linear, limiting, and clustering trends in large engine-architecture datasets, revealing key design sensitivities influencing engine performance
- Applied XGBoosted trees, correlation analysis, and DBSCAN clustering to explore high-dimensional architecture trade spaces
- Conducted techno-economic assessments of hydrogen fuel and sustainable aviation fuel (SAF) pathways for next-generation propulsion concepts

MITRE - Modeling and Simulation Intern
Cross-Cutting Urgent Innovation Cell *May 2023 – August 2023*

- Developed routing algorithms for maritime environments under uncertainty using Dijkstra's algorithm, Monte Carlo Tree Search, and genetic algorithms
- Modeled satellite orbit propagation and SAR/EOIR sensor projections to assess Low Earth Orbit coverage and observability constraints
- Validated algorithm outputs through unit testing and comparison with AFSIM physics-based simulations

TECHNICAL PROJECTS

Digital Services & MRO – Airbus Grand Challenge
Industry-Sponsored Research Project, ASDL, Georgia Tech
Faculty Lead: Dr. Woong Je Sung *Fall 2025 – Present*

- Prototyped an explainability layer for predictive maintenance alerts using representative deep learning and explainable models on C-MAPSS and Hawk T1A datasets
- Applied SHAP, LIME, Integrated Gradients, and other XAI tools to diagnose alert drivers, failure precursors, and model confidence

Aviation Futures Scenario Generation – Bauhaus Luftfahrt Grand Challenge
Industry-Sponsored Research Project, ASDL, Georgia Tech
Faculty Lead: Dr. Holger Pfaender *Fall 2025 – Present*

- Developed multi-agent LLM-based scenario generation frameworks for long-horizon aviation demand forecasting
- Incorporated FAA, Eurocontrol, and DB1B datasets to validate scenarios under alternative policy and sustainability assumptions

Independent Research – Contrail Mitigation Modeling Framework *Present*

- Developed preliminary probabilistic surrogate models and sequential decision formulations for contrail formation and routing
- Implemented early MCTS and POMDP prototypes to explore feasibility of uncertainty-aware operational decision support
- Explored Bayesian surrogate modeling for humidity and ISSR prediction with discrepancy-aware microphysics representations

HARMONy Mars Mission – Space System Design
Aerospace Engineering Capstone, Georgia Tech
Integration Phase Team Lead & Systems Engineering Lead *Fall 2024 – Spring 2025*

- Led systems engineering activities including requirements development, interface control, and cross-subsystem integration
- Coordinated subteam integration, resolving cross-coupled design constraints and synthesizing subsystem analyses into mission-level architectures, mass/power/resource budgets, and constellation design

SKILLS

Quantitative & Decision Methods: Probabilistic modeling, Bayesian inference, sequential decision-making (POMDP/MCTS), model explainability
Machine Learning & Data: Python (PyTorch, TensorFlow, Scikit-Learn, Keras)
Systems & Simulation: MBSE (SysML, MagicDraw), NPSS, MATLAB, EDS, FLOPS, AFSIM
Image Processing & Robotics: OpenCV, ROS
Programming & Tools: Java, C, Assembly, Git, Linux