

# Niloy Gupta

5820 White Pebble Path, Clarksville, MD 21029 • (443) 718-7077 • niloy@umich.edu

## Education

---

### University of Maryland

B.S., Aerospace Engineering with Honors

College Park, MD

May 2021

B.S., Mathematics (Applied Math)

May 2021

- Banneker Key Scholar

- Entrepreneurship and Innovation Honors Program

Citation May 2019

GPA: 4.00 (overall and in-major)

### University of Michigan

Ann Arbor, MI

Ph.D., Aerospace Engineering

Expected April 2026

- Research focus: data-driven, reduced order modeling for hypersonic aerothermodynamics

- Advisor: Dr. Karthik Duraisamy

GPA: 3.933

## Skills

---

- Linux, running command-line programs
- Running in-house, CFD RANS code on supercomputers
- CFD post-processing and result visualization
- Running adjoint simulations
- Solving CFD inverse learning problems using machine learning
- Frequentist and Bayesian statistical inference
- Developing reduced-order models
- MATLAB and its graphical user interface
- SOLIDWORKS, Siemens NX, Autodesk Inventor
- 3-D printing, CNC milling, Edgcam, G-code
- Multisim, digital electronics, embedded systems
- SISO control loop design
- PID loop implementation and tuning
- Ballistics trajectory analysis, OTIS
- Propulsion modeling, NPSS
- Model-based (systems) engineering, Cameo
- $\text{\LaTeX}$ , Word, Excel, PowerPoint, Photoshop
- Python, C, C++, Raspberry Pi, Arduino, RobotC
- HTML, CSS, and JavaScript
- Mathematical analysis and proofs
- Aerodynamic and stability analysis, XFLR5
- R/C aircraft design, analysis, manufacturing, testing
- Flow velocity measurement and experimentation

## Professional Experience

---

### Boeing (Virtual)

St. Louis, MO

Advanced Airbreathing Propulsion Intern

June 2021 – Aug. 2021

- Conducted technology maturation risk assessment for NASA's CHEETA project
- Organized and prioritized each subsystem's risks and determined areas for increased research focus
- Conducted open rotor/fan engine survey summarizing Boeing's past work in the area
- Presented my research and interviews to my colleagues to kickstart Boeing's renewed interest
- Used NPSS to adapt a turbofan model into an open rotor model to improve Boeing's open rotor modeling capabilities

### Boeing (Virtual)

St. Louis, MO

Advanced Airbreathing Propulsion Intern

June 2020 – Aug. 2020

- Selected as an early-hire engineering intern for the summer of 2020
- Analyzed ramjet propulsion data to determine errors and required improvements in CFD data
- Conducted sensitivity studies to determine areas for increased robustness for a ramjet-powered projectile
- Automated converting data maps for propulsion simulations using Python, significantly saving time

### University of Maryland, Active Flow Control Laboratory

University of Maryland, College Park, MD

Undergraduate Researcher (Mentor - Dr. Alison Flatau)

Jan. 2020 – April 2021

- Assisted the design and testing of a novel Resonant Pulse Combustion System for efficient active flow control
- Designed and implemented a particle image velocimetry (PIV) system to analyze actuator performance
- Developed a Python script to analyze footage at various PIV measurement parameters
- Analyzed the effect of measurement frequency and search window size on measurement accuracy
- Successfully validated the theoretical model of the pulse combustion system

- Presented my work at the 2021 AIAA Region I Student Conference

### **Ex-ABC Project for 125<sup>th</sup> Anniversary of the Clark School of Engineering**

University of Maryland, College Park, MD

Flight Systems Lead and Test Pilot

April 2018 – Nov. 2019

- Designed an electrically powered helicopter that utilizes the advancing blade concept
- Developed a variable center-of-gravity system to use to control the helicopter's attitude in lieu of a swashplate
- Programmed the control algorithms and code to run the helicopter
- Collaborated with five other students and simultaneously working on multiple aspects
- Utilized Arduino, CAD, sensors, and mathematical analysis to design various subsystems
- Successfully demonstrated that the variable center-of-gravity system is viable for pitch control in hover
- Placed 3rd at the 2019 AIAA Region I Student Conference; presented to industry professionals and engineering deans

## **Projects**

---

### **University of Maryland 2021 Design Build Fly**

University of Maryland, College Park, MD

Chief Engineer

June 2020 – present

- Designing, building, and testing an electrically powered airplane to complete various missions
- Responsible for system integration and overseeing manufacturing
- Created a computer program to do preliminary optimization and performance prediction of our aircraft configuration
- Performed aerodynamic and stability design and optimization, including airfoil selection and stability analysis
- Successfully led the team to build a plane that flew at 70 mph and successfully completed all missions
- Our team placed 11th overall, the university's best ever finish

### **Hypersonic Waverider Design Project**

University of Maryland, College Park, MD

Theoretical Design team member

Oct. 2019 – Dec. 2019

- Collaborated with other students to design and test a hypersonic caret-type waverider for a class project
- Used oblique theory to calculate the pressure and force distributions of a waverider in Mach 6 flow
- Utilized MATLAB to optimize the design for maximum lift-to-drag and volumetric efficiency
- Assisted with the manufacturing and testing of the waverider and image processing of the recorded test

### **Drivebox: Entrepreneurship and Innovation Honors Program Capstone**

University of Maryland, College Park, MD

Mechanical Design Lead

Jan. 2019 – May 2019

- Developed and pitched with two other students a social venture to help the physically limited gain independence
- Conceptually designed an affordable self-driving add-on kit for any car
- Interviewed potential customers and professionals in the automotive and rehabilitation industries
- Conducted market, social impact, and financial analyses to create a profitable business
- Pitched the company to a panel of business leaders at Terp Tank, a venture funding competition
- One of twelve 2019 University of Maryland Do Good Challenge semifinalists

### **ENES 100 Over-sand Vehicle Project**

University of Maryland, College Park, MD

Team Leader and CAD Modeler

Sept. 2017 – Dec. 2017

- Designed and built an autonomous over-sand vehicle that would locate and retrieve a box emitting infrared signals
- Utilized Arduino, Auto CAD, 3-D printing, machining, sensors, and motors to fabricate the vehicle
- Gained experience managing a group and working on a challenging project with limited time

## **Activities and Memberships**

---

Member of Tau Beta Pi Engineering Honor Society

Jan. 2019 – present

- Webmaster for the Univ. of MD chapter

May 2019 – May 2021

Member of Sigma Gamma Tau Aerospace Honor Society

Sept. 2018 – present

AIAA Membership

- National
- University of Michigan Chapter

March 2019 – present

Sept. 2021 – present

## **Honors and Awards**

---

Aviation Week 2021 20 Twenties Winner

July 2021

Alfred Gessow Academic Achievement Award

May 2021

AIAA Daedalus 88 Scholarship (\$10,000) Recipient

Sept. 2020

Joseph Guthrie Memorial Scholarship Recipient

May 2020