Joshua Manoj

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EDUCATION

University of Maryland - College Park — **Expected May 2030**
B.S., Aerospace Engineering — College Park, MD

Burlington High School — Weighted GPA: 4.49 — **June 2026**
AP: Physics C, Chemistry, Calculus BC, English Lit, Computer Science A — Burlington, MA

WORK EXPERIENCE & PROJECTS

Parametric Rocket, CAD Design & Flight Simulation — **August 2026 – Present**
Independent Project — Silver Spring, MD

- Modeled a 650mm rocket in SolidWorks with an equation-driven nose cone, motor mount, and fins around the body tube; transferred CAD mass and CG into OpenRocket to replace default estimates
- Simulated three motors (F42, G80, G125) with a 300–500m apogee target and a 1.5-2.0 caliber stability margin
- Writing a Python script using pandas and matplotlib to load OpenRocket's flight CSVs and plot the altitude, velocity, and acceleration for each motor, then compare the stability margin from CAD properties against OpenRocket's own built-in estimate

Young Scholars Program, Northeastern University — **July 2025**
Electrical Engineering Research Intern — Boston, MA

- Designed and built multiple solar-powered DC-DC phone charger prototypes to convert solar energy into safe and stable voltages for modern phones using circuit layouts and soldering in a university electrical engineering lab
- Improved the converter through multiple design iterations and simulations in PSIM (Power Simulation); achieved a <1% error rate in the final product
- Presented project findings through a formal poster and presentation to Northeastern faculty and mentors

FRC Team 2876, DevilBotz — **September 2022 – June 2026**
Vice President of Competition — Burlington, MA

- Developed and tested 15 Java-based autonomous routines using vision systems and PathPlanner, collaborating across mechanical, electrical, and drive teams to improve autonomous consistency to 85% successful runs.
- Led a 10-member programming subteam: delegated tasks, mentored new members in Java, built detailed documentation for vision calibration, and created communication meetings to unblock teammates
- Coached the driver, developed real-time match strategy, presented our team to judges, and coordinated with alliance teams

UMD Over Terrain Vehicle Project, ENES100 — **September 2026 – Present**
Introduction to Engineering Class — College Park, MD

- Designing and building an autonomous vehicle capable of navigating obstacles, measuring water depth, detecting pollutants, collecting a sample, and reaching the designated end zone
- Developing the vehicle's mechanical, electrical, and software systems using Onshape, Arduino, laser cutting, 3D printing, and Python

HONORS & AWARDS

FRC Excellence in Engineering Award (FRC Team 2876) | District Event Finalist (Grade 10 & 12) | President's Scholarship | MilliporeSigma Scholarship | AP Scholar with Honor Award | National Honor Society (NHS)

TECHNICAL SKILLS & INTERESTS

Software: SolidWorks, Onshape, MATLAB, Java, Python, Git, LabVIEW, OpenRocket

Electrical: DC-DC converter design, Soldering, Voltage regulation, PSIM simulation, Solar power systems

Robotics: Prototyping, 3D modeling, Computer vision, Camera Calibration, Robot odometry, Data Analysis, Agile process