Alvin Reji

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EDUCATION

Northeastern University, Boston, MA **Sep 2024 – Dec 2027**
Candidate for Bachelor of Science in Mechanical Engineering with an Aerospace Minor *GPA: 3.87*
Activities: AerospaceNU, ASME, Materials Engineering Research, TAMID, InterVarsity
Relevant Courses: Statics, Mechanics of Materials, Dynamics, Propulsion, Mechanical Design, Thermodynamics, Fluid Mechanics

University at Buffalo, Buffalo, NY **Aug 2023 – May 2024**
Activities: University Nanosatellite Program, Solar Splash Electric Boat Racing, ASME GPA: 4.0

SKILLS

Hardware: Microcontrollers, CNC Routing, 3D Printing, TIG Welding, Circuit Design, Soldering, Laser Cutting, Oscilloscope, ShopBot
Software: SolidWorks, Ansys, PrusaSlicer, MS Office, GSuite, Altium, MATLAB, AutoCAD, Python, C++, MATLAB, CAD, FEA, CFD
Interests: Rock climbing, Weightlifting, Volleyball, Spikeball, Cycling, Running, Hiking, Billiards, Photography, Videography, Pottery

EXPERIENCE

Massachusetts Institute of Technology **Cambridge, MA**
Teaching Assistant *Aug 2025 – Present*
- Educated 24 students on the iterative design process while introducing Six Sigma quality concepts to improve process reliability
- Fostered a collaborative, inclusive classroom by coaching conflict resolution, and promoting effective decision-making strategies

AerospaceNU CubeSAT at Northeastern University **Boston, MA**
Mechanical Engineer *Sep 2024 – Present*
- Designed optical component casings for 1U CubeSAT, ensuring structural integrity under launch and orbital conditions using FEA
- Generated ASME Y14.5-compliant engineering drawings using GD&T principles for high tolerance fabrication and assembly
- Fabricated prototypes using FDM and SLA 3D printing, conducting F3 verification and risk analysis prior to final machining

AerospaceNU Rocket Team at Northeastern University **Boston, MA**
Avionics Engineer *Sep 2024 – Present*
- Developed software for reliable sensor data acquisition on flight computers by implementing signal processing and noise reduction
- Designed flight computer PCBs optimized for power distribution, EMI compliance, and thermal management using KiCAD

Material Engineering Research at Northeastern University **Boston, MA**
Undergraduate Research Assistant *Sep 2024 – Present*
- Operated volumetric DIW 3D printers, achieving micron-level precision for fine-feature, hierarchal microstructures
- Designed and fabricated 30+ experimental samples using photopolymer resins and polymers to assess material properties
- Showcased adhesive manufacturing research at Northeastern's RISE conference to industry experts among 300 presenters

Solar Splash Electric Boat Racing at University at Buffalo **Buffalo, NY**
Electrical Engineering Subsystem Lead *Aug 2023 – May 2024*
- Led 7 engineers in designing and integrating an electric boat power system, achieving full NESC safety standard compliance
- Directed testing and troubleshooting, while mentoring team members on best practices to ensure reliable power system operation
- Optimized power system architecture, reducing overall cost by $7,000 through component selection reviews and design analyses

University Nanosatellite Program at University at Buffalo **Buffalo, NY**
Guidance, Navigation, & Control Engineer *Aug 2023 – May 2024*
- Developed MATLAB simulations for satellite missions, modeling orbital mechanics, attitude dynamics, and control responses
- Implemented Monte Carlo algorithms and Kalman filters to improve satellite state determination and reduce noise by 54%
- Authored interface control documents and led hardware trade studies on GN&C component viability for system integration

PROJECTS

GE1501 Cornerstone of Engineering at Northeastern University **Boston, MA**
Horse Racing Tracking Collar *Oct 2024 – Dec 2024*
- Designed and fabricated an ESP32-based collar using SolidWorks and FDM 3D printing, ensuring sensor stability and durability
- Implemented GPS and accelerometer integration, enabling accurate horse position and motion tracking with ±1 m positional error
- Developed embedded C++ software for real-time Wi-Fi data transmission and data visualization through a custom PyQt5 GUI

EAS199 UB Seminar Engineering Principles at University at Buffalo **Buffalo, NY**
Wind Turbine Project *Oct 2023 – Dec 2023*
- Engineered power-efficient wind turbines, optimizing performance and energy conversion through iterative prototyping
- Achieved top 10 placement among student teams for highest power output through innovative blade design and system efficiency

NASA Techrise Student Challenge **Elmont, NY**
Atmospheric Measurement of Noxious Gases Using Sensors (AMONGUS) *Nov 2021 – July 2022*
- Conducted pre-launch testing in low-pressure chambers, improving payload reliability by 30% under high altitude conditions
- Fabricated and assembled payload components using CNC machining and laser cutting, ensuring structural integrity during flight