Nikhil Garg

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Education

Georgia Institute of Technology Atlanta, GA

Bachelor of Science in Mechanical Engineering, Dean's List *Expected Graduation:* ***May 2027***

Coursework Completed: *Mechanics of Deformable Bodies, Statics, Materials Science, Differential Equations*

Experience

Undergraduate Research Assistant May 2025 – Present

Georgia Tech Manufacturing Institute *Atlanta, GA*

- Designed and validated a novel tensegrity-based vibration test fixture for ADAS sensor testing, achieving a performance increase from **20% to 92%** isolation using **SolidWorks** and **ANSYS** FEA modal analysis
- Optimized fabrication methodology for the test fixture using **Waterjet**-cut aluminum and **3D-printed** components, resolving **100%** of critical hook detachment failures through iterative redesign
- Integrated LiDAR, radar, and camera ADAS sensors with DAQ hardware and **Raspberry Pi**, establishing an accelerated protocol that compressed 10 years of vehicle stress into months for lifespan prediction

Equipment R&D Intern Aug 2025 – Dec 2025

The Coca-Cola Company *Atlanta, GA*

- Performed hands-on testing of dispensing products and electromechanical equipment to **validate performance** against SOPs, updating work instructions and test documentation to strengthen consistency and audit readiness
- Built **Python** fuzzy-match tools to correlate dispenser performance with equipment age across **1,800+** audits, guiding preventive maintenance and component replacement decisions
- Evaluated alternative components and materials with R&D and suppliers, developing cost-performance comparison criteria that enabled projected savings exceeding **$100,000** annually across future equipment platforms

Aerodynamics Engineer Aug 2024 – May 2025

HyTech Racing at Georgia Tech *Atlanta, GA*

- Simulated yaw-angle airflow in **CATIA V5** across **200+ cases**, reducing drag-coefficient inconsistency by **12%** and aligning **CFD** predictions within **±5%** of on-track aerodynamic data
- Integrated pitot-tube and pressure-tap measurements with **MATLAB** post-processing to improve cornering stability and reduce on-track test time by **35%** through refined aero geometry

Projects

Space Assembly Robot | *SolidWorks, Mechanism Design, GD&T* Aug 2024 – Dec 2024

- Modeled a conceptual **6 DOF** orbital assembly robot in **SolidWorks**, focusing on mechanism design to enable autonomous truss construction in microgravity environments
- Led system-level CAD integration for four major subassemblies, eliminating structural conflicts and verifying that **80%** of intended motion paths were feasible without linkage interference

Modular Airplane Assembly | *SolidWorks, 3D Printing, GD&T* Aug 2024 – Dec 2024

- Designed a modular airplane in **SolidWorks** using **snap-fit** features; applied **DFM** by tuning tolerances (**0.3 mm / 0.5 mm**) and optimizing print orientation for tool-less assembly
- Performed CAD-to-print tolerance analysis and iterated geometry to reduce shrinkage, clearance issues, and snap-fit stiffness, improving part fit and assembly repeatability

Autonomous Obstacle Avoidance Drone | *Python, Computer Vision, DJI Tello* Aug 2023 – Dec 2023

- Built an autonomous DJI Tello drone system using **Python** and **OpenCV** (grayscale, blur, Canny, contour filtering) to detect obstacles and execute real-time yaw/lateral corrections during indoor flight testing
- Developed a stable control loop that integrated live video processing with SDK-based UAV commands, enabling smooth forward navigation and consistent autonomous avoidance behavior

Skills

CAD/Analysis: SolidWorks, Ansys Mechanical, CATIA V5, AutoCAD, FEA, CFD, GD&T
Manufacturing: Test Fixture Design, Process Optimization, DFM, Root Cause Analysis, FMEA
Prototyping: 3D Printing, Laser Cutter, Waterjet, CNC Machining, Lathe, Wind Tunnel Testing, Wood & Metal Shop
Programming & Tools: MATLAB, Python, C++, OpenCV, Raspberry Pi, Arduino IDE, MS Office, Google Suite