ADITYA HALBE

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WHO AM I?

Mechanical Engineering graduate student specializing in systems engineering, design optimization, and advanced mechanical systems. Experienced in automotive and EV systems, UAVs, propulsion and mobility mechanisms, and structural analysis, with strong proficiency in CAD/CAE and MBSE. Seeking technical roles in the automotive, electric mobility, aerospace/defense, or robotics domains.

EDUCATION

Georgia Institute of Technology, Atlanta, USA **August 2024 - May 2026**
Master of Science in Mechanical Engineering

Dr. Vishwanath Karad MIT World Peace University, Pune, India **July 2020 - July 2024**
Bachelor of Technology in Mechanical Engineering

PROFESSIONAL EXPERIENCE

Kirloskar Oil Engines, Pune, India | *Engineering Intern* **August 2023 – February 2024**

- Research and development on power generation systems used in gensets.
- Learnt and developed new mounting system for components inside genset resulting in reduction of transmission of vibrations.
- Research on novel propulsion solutions for off highway applications involving hybrid and hydrogen systems.
- Formulating a new testing procedure for endurance of gensets over various loads and various speeds.

PROJECTS

Designing the Propulsion Subsystem for a Lunar Rover **2025**

- Designed the propulsion subsystem of a lunar rover using an Archimedes screw mechanism, targeting reliable mobility in low-gravity, high-regolith environments through system-level requirements and functional decomposition.
- Applied design process essentials including analogies, brainstorming, black-box modeling, bio-inspired design, solution mapping, proof-of-concept development, and iterative testing and prototyping to converge on a viable propulsion concept.

Development of a Low-Cost Anti-Missile Missile System **2025**

- Designed a low-cost anti-missile missile concept using **systems engineering**, including requirements analysis, functional decomposition, and mission-driven trade studies.
- Modeled system architecture, interfaces, and requirements traceability using MagicDraw/SysML, defining integration pathways for sensor, guidance, and interceptor subsystems.

Ninebot Electric Go-Kart Performance Optimization Project **2025**

- Modified and optimized a Ninebot electric go-kart for competitive racing using EV engineering principles such as battery management, electric drive systems, vehicle dynamics, and power electronics.
- Applied system-level trade-offs in energy efficiency, performance, and reliability, competing in team-based races and achieving 3rd place overall for total points.

Optimization of Multirotor UAV Design **2025**

- Led multi-objective optimization of a multirotor UAV design, using genetic algorithms (GA and NSGA-II) in MATLAB to balance trade-offs between hover endurance, structural weight, and component selection.
- Integrated discrete motor–propeller catalogs with continuous structural parameters and applied topology optimization and FEA validation to minimize mass under real thrust loads.

Structural and Modal Analysis on Engine Crankshaft **2025**

- Conducted parametric FEA in ANSYS on a 2-cylinder crankshaft under seizure conditions, evaluating stress, deformation, and design sensitivity to geometry and material choices.
- Performed fatigue life assessment using Goodman, Soderberg, and Gerber criteria, supported by mesh convergence studies and nonlinear material modeling.

Variable Buoyancy System **2024**

- Designed and developed a variable buoyancy system for underwater ROV applications using electric actuation.
- Applied principles of hydrodynamics, buoyancy, and marine stability to achieve controlled ascent, descent, and z-axis stability, supported by a theoretical pneumatic actuation model.

Team ProKarters | *Chassis Department* **2020 – 2023**

- Designed and manufactured the electric go-kart chassis for Team ProKarters at MIT World Peace University, Pune.
- Used AutoCAD, SolidWorks, and ANSYS for design and structural validation, and fabricated the chassis from AISI 4130 steel using TIG welding and conventional manufacturing.

TECHNICAL SKILLS

Design and Simulation: SolidWorks, CATIA 3DX, ANSYS, Abaqus, Fusion 360,FMEA, GD&T, DFMA, DVP

Systems Engineering: Model-Based Systems Engineering, MDAO, V&V, Requirements Engineering, Cross-Functional Integration

Design Tools: SPC, Control Charts, Reliability Engineering, Monte Carlo, Root Cause Analysis, PCA, DoE

Programming and Tools: Python, MATLAB, SysML, Arduino IDE, Cura, MagicDraw, Formlabs, Excel

Machinery: 3D Printing (FFF, SLA), Microfabrication: Lithography, Etching, Deposition, CNC, Multimeter