Vedang Mohandas Alle

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Education

Arizona State University **Tempe, Arizona**

Mechanical and Aerospace Engineering, B.S.E Expected 2027

- Dean's List – **GPA: 3.72**, New American University Scholar Award Recipient
- Relevant Coursework: Manufacturing I, Circuits I, Controls, CAD II, Data Structures & Algorithms, Energy Efficiency, Experimental Statistics, Heat Transfer, MATLAB II, Mechanical Design I, Random Signal Analysis, Stability of Vehicle Systems, Signals & Systems, Thermodynamics

Technical Skills

- **Programming Languages**: MATLAB, Verilog, LabVIEW, Python, C++, SQL, R
- **Hardware/Validation**: Oscilloscopes, Multimeter, Logic Analyzer, ROS dashboards, Sensor Integration, IC Packaging, PCB Design
- **CAD Software**: ANSYS (FEA), NX Siemens, Femap, SolidWorks (CFD), CREO, AutoCAD, CATIA V5, Cadence SiP, 3DEXPERIENCE
- **Engineering**: CNC Mill, End Mill, Drill Press, Design for Manufacturing, GD&T, Rapid Prototyping, Wind-tunnel Testing, 3D Printing (FDM/SLM), Design of Experiment, Lean Six Sigma, Microsoft Office, DFx, Injection Molding, Failure Modes Analysis, Thermal Modeling

Engineering Experience

Space Copy Inc – Hardware Engineering Intern Jun 2025 - Sep 2025

- Led the operation in identifying critical Titanium (Ilmenite/Anorthite) mining facilities on Lunar Regolith for **semiconductor manufacturing**.
- Curated a comprehensive strategy to balance **ore-abundance** and developed a renewable extraction method to establish future sustainment.
- Contributed to the conceptualization, **systems-design**, **BOM & procurement**, and **technical writing** for a Level 1 Robotic Arm installation.
- Supported the functional layout of **3D Printing systems** to tackle failure cases and prevent downstream issues for hardware-level validation.
- Implemented a library of conditional logic rules to support **system debugging** by detecting desynchronization, invalid state transitions, sensor mismatches, and system-level faults across each major hardware module for autonomous **additive manufacturing** architecture.
- Operated and maintained **FDM/SLM printers** through **bed leveling, nozzle swaps, extrusion calibration, and material changeover**.
- Developed calibration **SOPs** & **MSDS-compliant** workflows to improve first-pass validity & reduced unplanned rework for polymer handling.
- Led the Mechanical Design team in designing lightweight **composite** structures in **Creo** for durability under vibrational and thermal stress.

OEDEC Engineering – Mechanical (Geotechnical) Engineering Intern May 2025 - Jul 2025

- Built **MATLAB** test benches for embedded control loops on **PCB** assemblies, accelerating system validation for hardware integration.
- Performed **FEA** (stress & deflection) on a Multiple-Launch-Rocket-System while using **Verilog** to integrate sensor drivers in **Rocket Chip**.
- Performed **hoop stress analysis** to identify trends in hoop and stress to create safe pipeline operating conditions inside Rocket hydraulics.
- Ran **CFD** on **PCB** assemblies for thermal mitigation in defense-launcher electronics, quantifying heat-flux into control boards and implementing design changes that eliminated thermal-induced faults.

NASA L'SPACE - Chief Scientist & Thermal Engineering Intern Jan 2024 – May 2024

- Authored NASA's conceptual deliverables: **MCR, SRR, MDR, PDR** documenting systems design, verification modes, validation protocols.
- Developed closed-loop **Simulink** controllers for the robotic arm, and applied **failure modes analysis** to reduce system-level faults by **30%**.
- Modeled deployable solar structures in **NX**, ran **system reliability analysis** and translated results into hardware **bring-up test plans.**
- Delivered an **STM**, owned milestone budgets, & contributed to Mission Requirements sheet with compliance and verification protocols.
- Designed & modeled an origami solar panel CAD on **NX Siemens**, applied thermal analysis & reliability modeling techniques through **Cadence SiP** relevant to **microelectronics packaging** for the optimization of expansion/contractional behavior, increasing usable surface area by **45%**.

Academic Research

Rolston Lab (Scaling/Manufacturing of Thin Film Energy Materials) – Undergraduate Research Assistant April 2025

- Support **wafer fabrication** in the production of semiconductor devices and work with chemicals for **detector fabrication** processes.
- Identify **photostability** gaps in high band-gap perovskite compositions for optimized light absorption in perovskite-Si tandem solar cells.
- Design perovskites using **CNC Milling** to address key photo & thermomechanical effects, to accelerate degradation in tandem architectures.
- Develop **LabVIEW** front-panel UIs for experiment control & **Python**-based thermal map models (**MCRT**) to monitor thin-film energy devices.
- Experience with **thermal modeling**, **steady state & transient** analysis of **IC Packaging** in vacuum chambers to analyze material degradation.

Mercedes Benz - Suspension System Assembly & Simulation Aug 2024 – Dec 2024

- Ran **CFD** (**airflow/heat transfer**) and **FEA** (**thermal expansion**) on suspension subsystems, developing expertise in thermal-mechanical simulations used for heatsink design, cooling solutions, and package reliability analysis in electronics applications.
- **Published** comprehensive engineering documentation and performance reports, including recommendations for **systems-design** improvement.

Wind Tunnel Development – Mechanical Design Lead Jan 2024 – May 2024

- Designed a sub-sonic wind-tunnel in **CREO** for instructional & prototype testing, bridging mechanical design with **computational modeling**.
- Reviewed **automated calibration & sanity checks** for sensors and wrote calibration SOPs used by new lab users.
- Built a live **ROS-based dashboard** to aggregate **distributed sensor** feeds (barometer / anemometer / scannivalve / pressure transducer), time-sync logs, and visualized profiles along the tunnel.