Arjun Yeleshwarapu

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Education

University of California, Riverside, *B.S. in Mechanical Engineering* Sep 2023 - Jun 2027
- **Relevant Coursework:** Thermodynamics, Linear Systems & Control, Engineering Modeling & Analysis

Skills

Tools: SolidWorks, SolidWorks Flow Simulation, Fusion 360, Altair SimLab, Altium Designer

Software: MATLAB, Python (NumPy, Pandas, Matplotlib, scikit-learn), C/C++, Arduino, LaTeX, Git

Certifications: IBM AI Fundamentals, Cognite Data Fusion Fundamentals, Altium Education PCB Basic Design Course

Experience

Highlander Racing FSAE Electric Team, *Cooling Subteam Lead — Riverside, CA* Mar 2024 – Present
- Engineered a MATLAB thermal simulation workflow for the 26E liquid cooling loop, modeling motor/inverter heat generation and radiator dissipation to predict coolant temperatures throughout a dynamic race lap.
- Calculated pressure drops, including minor and major losses via Swamee-Jain equation; collaborated with the EE team to implement a custom 97.4% efficient 21V boost converter to meet the 8 LpM requirement.
- Developed empirical test methods to validate flow rates, cavitation thresholds, and loop volume, correlating results with MATLAB model assumptions.
- Integrated a sensor suite, including thermocouples and Hall-Effect flow meter into the cooling architecture to log system data and verify MATLAB simulation predictions.
- Designed 3D-printed and sheet metal components such as pump mounts and mounting tabs in Solidworks with a focus on serviceability and compact packaging.
- Implemented an embedded fan-control system on Arduino Uno R3 using custom PWM curves for six 36W fans to significantly reduce power draw while maintaining optimal temperatures.
- Scaled the Cooling Subteam from 2 to 11 members (4x typical annual intake), overseeing the full project lifecycle including CAD/BOM management, cross-system integration, and GD&T-compliant manufacturing drawings.
- Standardized technical documentation by instituting FFMEA and assembly manuals to ensure knowledge transfer.

Utthunga, *Mechanical Engineering Intern — Houston, TX & Bengaluru, India* Jun 2025 – Aug 2025
- Performed thermal simulation and design optimization for electronic enclosures; used Altair SimLab on a fanless automotive ECU to recommend MOSFET/cooling improvements and refined a sheet metal HART simulator enclosure in SolidWorks for manufacturability and thermal performance.
- Developed Python-based modeling and diagnostic tools for pump systems: created a parametric tool for pump performance curves and a 96%-accurate classifier using synthetic sensor data for OK/Warning/Failure states.
- Automated heat exchanger analysis by designing a modular Python tool using LMTD & ε-NTU methods, computing key performance metrics to reduce manual design effort.
- Gained insight into engineering business development by shadowing technical sales calls, analyzing client pain points and the end-to-end solution scoping process.

FIRST Robotics Competition Team 256, *President — San Jose, CA* Aug 2019 – Jun 2023
- Led subteams in designing, fabricating, and assembling competition robots; taught Fusion360 and machine shop safety to 25+ members.
- Managed team operations during COVID-19 and implemented sub-teams, improving member retention to 90% and restoring technical skills.

Projects

Strava Heatmap Project, *R'Cycle Co-Op — Riverside, CA* Ongoing
- Built a Python-based cycling route planner that generates bike loops using $\approx$ 5,000 miles of personal ride data, enabling exploration of new routes.
- Working on integrating air pollution data and UV index data to reduce negative health outcomes from exercising in industrial, traffic-filled corridors.

Home Energy Dashboard, *Personal Project* 2025
- Created a modular home energy simulation and dashboard modeling HVAC, appliances, EV charging, and solar PV for a 3-bedroom house to analyze cost-saving opportunities and system optimization.
- Integrated season-aware cost, load, and solar profiles with interactive visualizations and real-time control sliders.
- Implemented analytics for peak load, subsystem energy shares, and solar offset with actionable efficiency recommendations.