SIDHARTH SUNDAR

B.Tech Mechanical Engineering (Minor: EV Technology)

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Linkedin | **Portfolio Website** | Karaikal

SUMMARY

Final-year mechanical engineering student who is passionate about solving problems and understanding how things work, with a specific interest in vehicle design, fluid flow, and how geometry affects performance and stability. My hands-on projects have developed my curiosity, focus, and patience, and I am eager to apply these qualities to real-world innovations in automotive design, research, or simulations. I have a strong foundation in CAD design tools and simulation analysis. My experience includes Python programming and knowledge in automotive concepts like aerodynamics, vehicle dynamics simulation and battery thermal management.

EDUCATION

- **B.Tech in Mechanical Engineering (Minor: EV Technology)** — *CGPA: 8.34/10*
  National Institute of Technology (NIT), Puducherry — Nov 2022 – Jul 2026

SKILLS

- **CAD & Design Tools** NX CAD, AutoCAD, Fusion 360, CATIA, SolidWorks
- **Simulation & Analysis** ANSYS (Fluent, APDL), structural Analysis
- **Programming & Productivity Tools** Python (Intermediate), MATLAB/Simulink, MS Word, MS Excel
- **Automotive Domain** Vehicle Dynamics, Aerodynamics, Battery Thermal Management
- **Soft Skills** Curiosity, Problem-Solving, Adaptability, Teamwork

EXPERIENCE

- **Project Intern – Heavy Vehicles Factory (HVF) Avadi**
  Ministry of Defence, India — May 2025 – July 2025

  - Developed navigation algorithms for the "JetTank" robotic vehicle using Jetson Nano, ROS, and sensors (LiDAR, RGB-D, IMUs); implemented Color path tracking, waypoint navigation and contour-based obstacle avoidance.
  - Collaborated with production teams to study armoured vehicle assembly, gaining insight into manufacturing processes (Arjun, T-90, T-72 tanks).

PROJECTS

- **Thermal Conductivity using TPS 2500S**
  Lab-Based Project

  - Measured thermal conductivity of copper at –10 °C, 21 °C, and 60 °C using **TPS 2500S**; achieved mean values up to 383.76 W/m·K.
  - Ensured high accuracy with **0.055%** repeatability and **17 μK** sensitivity using a Hot Disk sensor.
  - Calibrated the system with a stainless-steel reference and conducted tests across varying sample temperatures and durations.

- **Design-Focused Study of Hydrodynamic Flow Characteristics in Underwater Vehicles**
  ANSYS Fluent – CFD Simulation

  - Modeled conceptual submarine and Titan submersible bodies in **Fusion 360**; simulated external flow in ANSYS Fluent at velocities between 20–60 m/s.
  - **Excluded propeller thrust**; focused on how hull shape influences wake formation, eddy zones, and pressure/velocity distributions.
  - Analysed drag forces and identified shapes responsible for flow separation; achieved drag coefficients of **0.297 (submarine)** and **0.413 (Titan)** using the k - SST turbulence model.

- **Closed-Loop V/f Control and Dynamic Braking of a 3-Phase Induction Motor**
  Electrical Motor Drives - Simulink Simulation

  - Developed closed-loop V/f speed control for 3-phase induction motor using PID controller and PWM inverter
  - Implemented dynamic braking circuit to dissipate regenerated energy during deceleration through resistive load
  - Achieved and maintained a stable reference speed of **1500 rpm**, with the system settling after an initial transient dip in **0.4 seconds**.

- **CFD Analysis on Golf Ball**
  Aerodynamic Design Study

  - Modeled a stationary golf ball in NX CAD and simulated in ANSYS Fluent to study airflow interaction and outer flow separation regions.
  - Explored drag and lift forces visually (without thrust or pressure analysis), gaining a conceptual understanding of aerodynamics.

LANGUAGES

English: Fluent
Hindi: Fluent

Tamil: Native