

DHRUVAL JAVIA

Mechanical engineering graduate student with two years of industry experience, passionate about building practical, scalable solutions for energy challenges, with an innovation and sustainability-driven outlook. Experienced in thermal and electrochemical system modeling, design optimization, and simulation-based analysis of batteries and industrial energy systems.

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EDUCATION

Year	Institute	Qualification	CGPA
2024 – present (Expected 06/2026)	Stanford University	M.S. in Mechanical Engineering (Depth in Energy and Transport Sciences)	3.751/4
2018-2022	Indian Institute of Technology, Bhubaneswar	B. Tech. in Mechanical Engineering	9.39/10



WORK EXPERIENCE

THERMAX LTD. | Trainee – Advent Rotational Program | August 2022 – July 2024

- Mapped manufacturing processes for boilers and heaters on the factory floor, identified bottlenecks, and proposed automation improvements; prepared detailed **RLA** and **RCA** reports based on site evaluations.
- Led a team project on **standardization of the design and techno-commercial offering of a biomass-fired thermal oil heater**, leading to a **7.4% reduction in total weight** and a **10.2% decrease in total footprint area** as compared to the previous design. Activities involved include *grate & BOP/auxiliary equipment sizing, layout preparation, thermal & pressure drop simulations, and maximum film temperature & efficiency calculations*.
- As part of the project, developed a **thermal model** of the **APH, Economizer** and **MPA furnace** in **EXCEL** with **VBA automation** to iteratively design the heater, and validated it with existing data. The model provided *inlet/outlet temperature values within 2%, 6% and 10% error* in APH, Economizer and MPA furnace respectively.



ACADEMIC PROJECTS

EFFICIENT BATTERY THERMAL MANAGEMENT SYSTEMS FOR EV | COMSOL, Electrochemical Modelling

2021-2022 | Final Year B. Tech. Thesis Project | Supervisor: Dr. B. R. Pattabhi

- Performed degradation studies through **multiphysics numerical simulations** using **COMSOL** software by employing a **coupled 1-D electrochemical and 2-D thermal model of the battery pack** integrated with a **capacity fade model**.
- Published the work in the “**Energy Storage**” journal having an *impact factor of 3.2*.

MACRO-SCALE DESIGN ASPECTS OF EV BATTERY PACK | MATLAB, Excel, Battery Pack Design

2021 | Summer Research Internship Project | Supervisors: Dr. Sundararajan Natarajan (IIT Madras) and Dr. B. R. Pattabhi (IIT Bhubaneswar)

- Performed battery pack design calculations by developing a system of equations in **EXCEL** and implementing it in a **MATLAB app**. The app sliders were used to analyze the effect of battery pack design parameters on EV performance.

AEROCASE | Sheet Metal Working, TIG Welding, Sand Casting, Woodworking, 3D Printing, Fusion 360

2025 | Individual Course Project | ME 203: Design and Manufacturing, Stanford University

- Designed and fabricated a compact, innovative, and functional instrument case that ensures the safe storage of Aerodrum instruments while reflecting the aesthetic essence of music.
- Materials used include *Al 5052 aluminum sheet, A356 cast aluminum, pine wood, Duron, and polyurethane foam*.

GAS DYNAMICS SIMULATOR | MATLAB, Vector Algebra, Hash Grid Optimization

2025 | Individual Personal Summer Project

- Built a **MATLAB-based simulator** for particle dynamics and association chemical reactions in an ideal gas, implementing **hash grid optimization** to reduce collision detection algorithm complexity.
- Developed an interactive MATLAB app with numeric and GUI-based input to improve user experience, providing time-series plots and dynamic animations as post-processing outputs for analysis.



TECHNICAL SKILLS

SolidWorks

ANSYS

COMSOL

Arduino

Python

MATLAB

Cantera

COURSEWORK

Thermodynamics

Numerical Analysis

Heat Transfer

Physical Gas Dynamics

Chemical Kinetics

EXTRA-CURRICULAR ACTIVITIES

- Associated with the **robotics society** and the **music society** (*as a drummer*) at IIT Bhubaneswar (2018-2022).
- Held the position of **Student Placement Coordinator** (2022) and *coordinated with various internal and external stakeholders* such as institute's placement cell, company recruiters and students for ensuring a smooth placement process.
- *Participated and led* a team of 4 members in the **annual e-yantra robotics competition** (eYRC 2019-2020) organized by IIT Bombay.
- Achieved **5th rank** out of 82 participants in the **GrabCAD shop challenge** (2020) held online on the GrabCAD community website. The challenge involved *designing an innovative product which can be 3D printed*; have made a *2-in-1 mechanical hand blender cum egg beater*, and have submitted CAD files along with a stress analysis report. **SolidWorks** and **ANSYS** was used for CAD modelling and analysis.
- Achieved **2nd rank** in the *eastern fusion group music competition – “Sargam”* organized as a part of Spring Fest 2020 at IIT Kharagpur.