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.
- Lead 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 be used to *analyse the effect of battery pack design parameters on EV performance.*

AEROCASE | Sheet Metal Working, TIG Welding, Sand Casting, Wood Working, 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 ACTIVITES

- Associated with the **robotics society** and **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 lead* 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.