GUNDETI SRIVARDHAN

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B.Tech - Mechanical Engineering
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Education

Degree/Certificate	Institute/Board	CGPA/Percentage	Year
B.Tech. Major	Indian Institute of Technology, Guwahati	7.79 (Current)	2021-Present
Senior Secondary	TSBIE BOARD	97.4%	2021
Secondary	CBSE BOARD	89.2%	2019

Experience

- **Battery Design & Analysis Lab (BDAL)** *May. 2024 - Aug. 2024*
  *Research Intern (**LOR**$_1^*$, **LOR**$_2^*$)* Huazhong University of Science and Technology, China
  - Inspired by the **herringbone structure** of fish skeletons, optimized by nature over millions of years, designed a **cooling plate** using **topology optimization**. Achieved a **T max drop** of **1.02°C**, a **45.41%** reduction in **pressure drop** and a **32.46% reduction in material usage** compared to **conventional designs**, resulting in **reduced production costs** and **increased** cooling plate **efficiency**.
  - Improved energy efficiency by **reducing parasitic power consumption** by **45.41%**, outperforming traditional designs across **all flow rates**, while matching the performance of double-outlet designs with a **simpler system architecture**.
  - Performed topology optimization in **COMSOL** by setting design parameters and boundary conditions, using the **MMA method** to obtain the final 2D result. The 3D geometry was then created in **SolidWorks**, followed by **Computational Fluid Analysis** in **ANSYS** to obtain the final results.
  - Submitted my research findings for publication in a **reputed journal**, highlighting **significant contributions** to the field of **thermal management in lithium-ion batteries**.
  - Recieved **Letters of Recommendation** (**LOR**$_1^*$, **LOR**$_2^*$) from my professors in recognition of my excellent results and demonstrating exceptional diligence, responsibility, and hard work during my research internship.

Projects

- **Optimizing Charging Time of Electric Vehicles (EV's)** *Jan. 2024 - May. 2024*
  Project under Professor, Dr. Poonam Kumari, Department of Mechanical Engineering, IITG. Report*
  - Developed a battery charging solution using **MOSFETs** & **IGBTs**, reducing EV charging time by **66%** through a **three-section** battery design. Achieved a **25% cost reduction** via market analysis.
  - Designed a **dual-cooling** mechanism with coolant as **PCM**, using **0.6 mm hollow fins** for better circulation. Implemented multi-layer **PTFE** insulation to improve **heat transfer** and **safety**.
  - Proposed a novel **EV charging network** along **major highways** in India by partnering with Dhaba owners, **enhancing accessibility** for long-distance travel.
- **Chatter Prediction Using Image Processing** *Jan. 2024 - May. 2024*
  Project under Professor, R. K. Mittal, Department of Mechanical Engineering, IITG. Report*
  - Devoloped a **Sequential Convolutional Neural Network (CNN)** model in **TensorFlow** to classify a dataset of 91 pairs of **machined surface** images as **Chatter** or **Chatter-free**, achieving **100%** training accuracy and **71%** test accuracy.
  - Targeted **real-time chatter prediction** by planning the integration of high **FPS cameras**, enhancing the model's applicability for **practical machining environments** and aiming to **increase accuracy** to over **95%**.
  - Employed **OpenCV**, **PIL**, and **Numpy** to convert **DSLR-captured** images into **CSV** format for training, ensuring **high-quality** input data for **accurate predictions**..

Research Publications

- **International Journal of Green Energy (IJGE)**, Certificate* *Sep 2024*
  - Pioneered research on a unique herringbone-based cooling plate for lithium-ion batteries, optimized through topology methods. Secured validation and high praise from leading professors at Huazhong University of Science and Technology (HUST) and the Indian Institute of Technology Guwahati (IITG), leading to publication acceptance and recognition in the engineering community.

Technical Skills

- **Engineering Software**: COMSOL, ANSYS, LINKAGE, MATLAB"
- **CAD and CAM**: SOLID WORKS, CATIA, SOLID EDGE
- **Programming Languages**: C/C++, Python"
- **Others**: Numpy, Pandas, MS Excel, HTML, CSS, Power BI, WhiteBoard Animation *" Elementary proficiency*

Key courses taken

- Optimization Methods in Engineering
- Fundamentals of Artificial Intelligence
- Dynamics of Machining Processes
- Industrial Engineering and Operations Reseach.
- Applied Thermodynamics
- Heat Transfer
- Design of Machine Elements
- Mechanical Measurements
- Solid Mechanics
- Modern Control
- Electrical Machines
- Fluid Mechanics

Positions of Responsibility

- **Core Team**, TechExpo, Techniche, IIT Guwahati *Dec. 2022 - Sep. 2023*
- **POC - Smart Assistant**, Robotics Club, IIT Guwahati *Nov. 2022 - Apr. 2023*

Achievements

- **Student Intern under Rastriya Avishkar Abhiyan** ,Learnhill Technologies Private Limited *2024*
- **Merit-cum-Means Scholarship**, Awarded the MCM Scholarship from IIT Guwahati for academic excellence. *2023*
- **Branch Change**,Upgraded my major from Chemical Engineering to Mechanical Engineering based on merit. *2022*
- **National Level Player**, Vall Veechu (Sword Fight), School Games Federation of INDIA (SGFI) *2019*