Lovedeep Singh

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Work Experience

Mechanical Engineer, *Exro Technologies (Calgary, AB)* *March 2022 - Present*

- Responsible for the Exro's high voltage (400V & 800V) motor drives design and development activities.
- Design and Develop fixtures (mountings) for electric motors for dyno testing using Solidworks and simulated using Ansys.
- Developed detailed
- Simulated the design of a liquid cooling system in **Ansys Fluent** by creating a comprehensive model of **MOSFETs (with die)**, PCB (incorporating copper layers), thermal interface materials(**TIM**), and **heatsinks**.
- Identify capacitor vibration failure and expedited DV testing time by one month through vibration design simulations conforming to **ISO 16750 standards** in Ansys Workbench.
- Collaborated closely with manufacturers to implement design changes aimed at optimizing manufacturing processes for cast heat sinks and injection-molded plastics, with a production target of 100 thousand units annually.
- Collaborating closely with manufacturing, electrical, and supply chain teams to promptly accommodate design changes and achieve goals.

Lead Mechanical Engineer, *Cellpropulsion -Bangalore, (India)* *April 2019 - Aug 2020*

- Led a three-member team and collaborated with other teams to oversee and coordinate tasks, ensuring the successful retrofitting of a 16-tonne diesel bus with an electric powertrain.
- Conducted thorough calculations for power consumption and range based on the **Indian driving cycle**, guiding the sizing of critical powertrain components such as the battery pack, motor, and **cooling system**
- Developed a detailed CAD model of an electric power train on a bus chassis, ensuring compatibility with space constraints and maintaining the original weight ratio for optimal performance.
- Engineered electric motor mounts, encompassing CAD modelling, analysis, and manufacturing.
- Engaged in thermal calculations, layout design, and the implementation of a **liquid cooling system** in buses.

Mechanical Engineer, *Cellpropulsion -Bangalore, (India)* *Dec. 2017 – March 2019*

- Led the prototype design of a **1.2 kW on-board charger** for Ultraviolette Automotive, ensuring design align with customer requirements.
- Conducted thorough thermal simulations using **Flotherm**, designed a **heat sink**, and selected an **optimal fan and Thermal interface material** to ensure the effective **Air cooling** of the charging system.
- To minimize expenses, opt for enclosure construction through the assembly of individual aluminum walls using welding instead of CNC machining from a solid block. This method results in approximately **40% cost savings** for prototype manufacturing.
- Actively participated in **in-house thermal testing**, validating the charger's performance under steady-state conditions and refining the design accordingly.

Internship

Technology Developer - Intern, *Stash Energy - Fredericton, (NB)* *May 2021 - Aug 2021*

- Conducted simulations for a heat exchanger integrating **phase-changing material** to validate energy storage and discharge time.
- Actively participated in assembling 20 customer units of a heat exchanger with a sheet metal case, gaining valuable hands-on experience in the process.

Design Intern, *Cellpropulsion (Bangalore, (India)* *Jan 2017 - June 2017*

- Responsible for delivering thermal simulations of 1kW Flux switching DC excited prototype motor.
- Developed a natural **(air cooling)** convection solution for the motor by conducting detailed thermal simulations on motor fins using **Siemens FEMAP (TMG)**.
- Reduced **Computation time for thermal analysis by approximately 10 %** by developing an analytical thermal conductivity model of motor wiring and steel laminates.

Education

M.Eng in Mechanical Engineering, *University of New Brunswick* | Fredericton, NB *2020-22*

B.Tech in Mechanical Engineering, *Guru Nanak Dev engineering College Ludhiana* | Ludhiana, India *2013-17*

Skills

CAD	Solidworks, Creo
Thermal Analysis Tools	Mentor FloTherm (Electronics Cooling), Ansys Fluent, Siemens FEMAP(TMG)
Mechanical Analysis Tools	Ansys Workbench, Ansys Sherlock (PCB-Reliability)
Engineering Process	Design Failure Mode and Effects Analysis-DFMEA (VDA-SAE), Root cause analysis-(RCA)
Coding Skills	Pyhton (CS50-Certification)