Lovedeep Singh (P.Eng - In Review)

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Work Experience (6+ years)

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

- Collaborated with the client to resolve coolant leakage in an electric motor drive by conducting root cause analysis, completing an 8D report, identifying fastener pitch issues, and implementing a solution by adding a fastener near the leak.
- Conducted submersion testing per **ISO 19453-4**, identified leak failures near glands, and implemented a reliable solution by selecting and testing improved off-the-shelf glands.
- Resolved fitment issues between the phase separator plastic and heatsink by adjusting position tolerances, transitioning from **worst-case to RSS tolerance analysis.**
- Worked closely with technicians to continue production of motor drive units.
- Hands-on experience in setting up motors on a dyno, inspecting couplers for runout and alignment, and ensuring reliable operation at 15,000 RPM without failures.
- Led the design and setup of a 1MW dyno table, collaborating with senior management to **reduce the cost** of the 2" thick steel top plate and legs structure from **70,000 CAD to 25,000 CAD** by splitting it into 2 parts, thereby lowering the machining cost for the top surface.
- Designed and assembled **motor mounts, coupler, cooling, and lubrication system for a 15,000 RPM motor**. Resolved bearing selection issues by reducing diameter and splitting the shaft assembly.

Lead Mechanical Engineer, *Cellprop Pvt. Ltd. -Bangalore, (India)* *April 2019 - Aug 2020*

- Led a five-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 layout, ensuring compatibility with space constraints and maintaining the original weight ratio for optimal performance.
- Engineered electric motor mounts, encompassing CAD modeling, analysis, and manufacturing.
- Engaged in thermal calculations, layout design, and the implementation of a **liquid cooling system** in buses.
- closely monitored temperatures and the liquid cooling system while the testing stage of the project.

Mechanical Engineer, *Cellprop Pvt. Ltd. -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.

Internships

Design Internship, *Stash Energy - Fredericton, (NB)* *May 2021 - Aug 2021*

- Developed detailed CAD models and engineering drawings for the sheet metal outer casing of a heat pump unit.
- Actively participated in assembling 20 customer units of a heat pump, gaining valuable hands-on experience in the process.

Thermal system Design Intern, *Cellprop Pvt. Ltd. (Bangalore, (India)* *Jan 2017 - Dec 2017*

- Responsible for delivering thermal simulations of 1kW Flux switching DC excited prototype motor.
- Calculated and simulated number of fins required for the natural cooling of the motor 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) Canada *2020-22*

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

Skills

CAD & Drafting: Solidworks, Creo, GD&T - ASME Y14.5-2018

Thermal Analysis Tools: Mentor FloTherm (Electronics Cooling), Ansys Fluent, Siemens FEMAP(TMG)

Mechanical Analysis Tools: Ansys Workbench, Ansys Sherlock (PCB-Reliability)

Manufacturing: Injection molding, Aluminum Casting, CNC Machining, 3D printing

Engineering Process: Design Failure Mode and Effects Analysis-DFMEA (VDA-SAE), Root Cause Analysis (RCA)

Programming & Computer Skills: Pyhton (CS50-Certification), Microsoft Office Suite