Matteo Aiello

Mechanical Engineer-In-Training

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EDUCATION

University of Victoria

Bachelor of Engineering (BEng): Mechanical Engineering – GPA: 3.8/4.0

WORK EXPERIENCE

Manufacturing Engineering (Battery) Co-op – Tesla Motors Inc.

Jan – May 2022 | Fremont. CA

- Worked as part of the Battery Manufacturing Process Development Team with focus on the Model Y Structural Battery, implementing and validating design for manufacturing, process optimization, and battery joining methods.
- Operated and maintained 6-axis potting/sealant robots for manufacturing and product development, employing strict safety protocol and engineering practices.
- Designed and assembled test jigs and development tools to support battery manufacturing and design.
- Acted as a primary point of contact for battery teardown R&D, implementing smart data collection methodology, coordinating/delegating work, and innovating processes.

Mechanical Engineering Co-op – General Fusion Inc.

May – September 2021 | Burnaby, BC

- Worked on testing and optimizing the team's primary compression test bed: the Cylindrical Water Compressor (CWC). The CWC simulates shaped collapses for plasma compression in a nuclear fusion reactor using pneumatics.
- CWC-related tasks included pneumatic design/assembly, 3D modelling, Python scripting for pressure analysis, automation in LabVIEW, 3D printing (SLA), diagnostic equipment calibration, development, and assembly.
- Designed of a custom calibration device to mitigate error in image-recognition algorithms. Conducted design reviews of 3D models, machined custom parts, and assembled the apparatus.
- Operated a pressure vessel with high-powered, red/infrared, collimated lasers from an integrated control panel.
- Created various test jigs for simulation of certain events/behaviors related to optics and pneumatics.

Mechanical Engineering Co-op – Ergonomyx Technologies Canada Inc.

May – September 2020 | Victoria, BC

- Acted as one of two mechanical engineers in a small start-up company, yielding experience with increased responsibility, independence, and communications.
- Underwent extensive design, prototyping, assembly, and iteration of mechanical systems with challenging time and budget constraints. Employed practices like 3D printing, modelling, soldering, machining, circuitry.
- Developed a quiet, efficient energy harvesting solution with brushless DC motors using pulley systems and hardware electronics that was implemented in stationary bikes.

Manufacturing Engineering (Battery) Co-op – Corvus Energy Inc.

January – May 2019 | Richmond, BC

- Assembled and utilized a thermocycling test jig to simulate an accelerated life model of stress on Aluminum-Copper welds caused by differential thermal expansion coefficients.
- Developed python scripts to plot/evaluate resistance (voltage drop) data from a welded-tab battery jig DAQ in MATLAB.
- Modelled and evaluated various battery module testing jigs using Solidworks. Finite Element Analysis was used to understand stress cracks and other failure modes on prototype laser welds.

TESLA

Victoria, BC

2017-2022

general**fusion**

🌔 corvus

ergonomyx

WORK EXPERIENCE (CONT.)

Mechanical Engineering Co-op – Crescent Point Energy Corp. (CPG)

May - September 2018 | Calgary, AB

- Assisted with and provided research for multiple projects with aim to reduce company carbon intensity (emissions/production). Focused primarily on solar, wind energy and power reduction.
- Performed economic modelling, emission projections, power savings, and CAD layouts to help assess the feasibility of new projects. Worked with PFDs, P&IDs, and other schematics.
- Utilized the laws of fluid mechanics and thermodynamics to make calculated projections for heat exchangers.

PROJECT EXPERIENCE

Battery Vision System - Tesla Motors

Developed an in-line battery vision system capable of validating Model Y battery manufacturing processes with image recognition, a smart datum system, appropriate mechanical infrastructure, and automated control compatibility.

Optical Calibration Device (OCD) – General Fusion Inc.

Designed and assembled a device for optical calibration of diagnostic equipment on a compression test bed called the Cylindrical Water Compressor (CWC). The apparatus can translate to precise locations within a pressure vessel and provide spring-actuated fiducial arms for high-speed cameras.

Laser Weld Test System– Corvus Energy Inc.

Designed and executed a comprehensive test plan to assess prototype weld designs on thermocycling jigs, simulating strain/stress of regular operation. The jigs were operated using a microcontroller-based system with sensors and a DAQ.

Energy-Harvesting Bicycle – Ergonomyx Technologies Inc.

Helped design an energy-harvesting solution for stationary bicycles using Fusion 360, 3D-printing, electrical hardware, and machining to conceive a DC motor-to-pulley mechanism capable of generating 5V at 30rpm.

Vibration Testing Model – Corvus Energy Inc.

Established a method of accelerated-life testing for vibrational fatigue of shipboard batteries with LabView and MATLAB.

Mechatronic Sorting System - University of Victoria

Programmed a sorting system for differing materials using an MCU, various sensors, stepper motors, and electrical hardware.

TECHNICAL COMPETENCIES

Design – Solidworks, CATIA, AutoCAD, Fusion360, Siemens NX12, GD&T, DFM, Microsoft Vizio, PFDs, P&IDs.

Testing – Smart test cases/scripts (Python, MATLAB, LabVIEW), Finite Element Analysis (ANSYS and Solidworks Simulation), Test Fixtures.

Software - Programming (MATLAB, C, Java, Python), Microsoft Office, Github/Gitlab, MySQL.

Physical – Circuitry (PCB applications, circuit testing, soldering, etc.), Pneumatics, 3D Printing, Machining.

Manufacturing – Lean, PLM, Process Stability/Capability, OEE, Writing MI's, Six-Sigma, SPC, 6-Axis Robot Operations.

REFERENCES

Jack Gall – Manufacturing Engineer, Tesla Motors Inc.

Wade Gyllenhaal – Sr. Manager, Tesla Motors Inc.

Scott McNally – Professional Engineer. Harvard, Stanford Graduate

Piotr Forysinski – Manager, General Fusion Inc.

*Referee contact information available upon request. *See *https://matteoaiello.github.io* for more information on projects, skills, etc.