Frederic Deslauriers

Mechanical Engineering & Computing Technology Student

An independent and self-motivated fifth-year engineering student with an interest in mechanical design, robotics, software development and sustainable energy. My greatest assets are my insatiable curiosity, honesty and perseverance.

For more evidence of exceptional ability, visit my interactive portfolio here: https://fredesl406.github.io/myPortfolio

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SUMMARY OF QUALIFICATIONS

- Excellent grasp of ***engineering fundamentals***: statics, dynamics, heat transfer, fluid mechanics and control systems.
- Extensive ***CAD and engineering drawing*** experience acquired through previous internships and design projects.
- Hard-working and reliable individual who is able to set priorities, manage time effectively and remain organized.
- Excellent interpersonal and teamwork skills honed through 5+ years of internship and group project experience.
- Passionate about accelerating the transition to sustainable energy and the potential to make a difference.

Skills: Basic | Intermediate | Advanced

SolidWorks | AutoCAD | Revit | CATIA | GD & T | 2D & 3D Engineering Drawings | Finite Element Analysis (FEA) | Design for Manufacturing & Assembly (DFMA) | Machine Element Design | Java | Python | MATLAB | C | Git

RELEVANT WORK EXPERIENCE

Mechanical Design Engineer Intern | S&R Mechanical | Ottawa, ON

05/2021 – 08/2021

Mechanical and plumbing services in commercial and residential sectors.

- Led the ***mechanical computer-aided design*** of plumbing networks and mechanical rooms using ***Revit*** and ***AutoCAD*** for 3 large multi-million-dollar commercial building projects. Received an exceptional employer performance rating.
- Revised ***construction and engineering drawings*** and produced ***3D CAD models*** that involved the selection of pipe fittings, services and materials and rerouting/aggregating pipe sections into assembly racks to avoid interference and facilitate installation with ***design for assembly (DFA)*** in mind. Saved $100,000+ in production and assembly costs.
- Produced ***500+ engineering drawings and bills of materials (BOM)*** for piping segments using ***Revit*** and ***AutoCAD***. Met deadlines and stayed within budget by working overtime and producing quality drawings to minimize recalls.
- Coordinated CAD designs with project managers and foremen on a regular basis through email communication and meetings, discussing the feasibility of certain design elements and performing modifications upon request.

Test & Characterization Intern | AEPONYX inc. | Montreal, QC

01/2020 – 08/2020

Market leader in MEMS-based silicon photonics.

- Assisted in the development of a new test station by designing 3D printed parts in ***SolidWorks***, leading the assembly of the test setup, performing ***100+ tests*** and troubleshooting issues using ***root cause analysis*** and automating motorized micromanipulators in ***Python*** to align optical fibers. Met critical testing deadlines with excellent results and received an exceptional employer performance rating.
- Measured and analyzed data from complex photonic devices in a lab, using ***Excel*** to spot trends, crunch the data and present the results in ***technical reports***. Prepared ***PowerPoint*** presentations to discuss results and provide recommendations to the team.
- Assisted in the design of an XFP transceiver module by modelling components in ***SolidWorks*** and performing ***finite element analysis (FEA)*** to assess the performance of components under loads using ***SolidWorks Simulation***.
- Optimized the CAD design of micro-electro-mechanical systems (MEMS) by redesigning actuation pads, springs and platforms to enhance actuation performance. Used ***finite element analysis (FEA)*** to simulate actuation movements.

EDUCATION

BASc in Mechanical Engineering | BSc in Computing Technology

2017 - Present

University of Ottawa, ON

GPA: 8.67/10.00

- Fifth-year student projected to graduate in summer 2023.
- **Dean's Honour List:** Awarded for attaining a GPA greater than 8.00 from 2018 to present.
- **Admission Scholarship:** Awarded for an admission average of 85% in 2017.

RELEVANT PROJECTS & EXTRACURRICULARS

Autonomous Robots Intersection Crossing | University of Ottawa, ON *03/2022*

- Designed a robot prototype with GPS, gyroscope and LiDAR in a simulation environment to explore self-driving and intercommunication capabilities at T-intersection crossings. Successfully implemented 5 scenarios where robots used vehicle to vehicle communication to avoid collisions without stopping at the intersection crossing.
- Led the development of ***Python*** scripts for self-driving capabilities by writing an object detection function making use of the LiDAR data output to avoid collisions with nearby vehicles and obstacles. Assisted a teammate with lane-keeping and turning abilities which were made possible by monitoring GPS and gyroscope data.

Capstone Project: Helicopter Drone Design | University of Ottawa, ON *09/2021 – 12/2021*

- Designed a helicopter drone by modelling and sourcing components in ***SolidWorks***, using ***machine element design*** knowledge to model and mount shafts, gears and bearings, selecting suitable materials for each component and applying ***design for manufacturing and assembly (DFMA)*** principles throughout the computer-aided design process.
- Ensured feasibility of design through extensive calculations and analysis of forces, torques and fatigue, statics and dynamics, kinematics, fluid mechanics, thermodynamics, energy consumption and by applying logical safety factors.
- Developed innovative solutions to enhance drone portability by making the tail and legs detachable through a set of telescopic pins and allowing linear slideout of the tail shaft from the main gear hub using a male-female spline configuration. Conceptualized design solutions through ***10+ hand sketches*** before proceeding to ***CAD modelling***.
- Parametrized the drone model in ***MATLAB*** for varying payload weight, size and survivable impact height in order to make the design more flexible to changing requirements. Given these inputs, the code calculates optimal dimensions of components and automatically updates the ***SolidWorks*** global variables to reflect the ideal model.
- Led a team of five by organizing team meetings, taking notes of key questions to discuss with the client and including team members in core project decisions by encouraging discussion and creating polls.
- Prepared ***6 technical reports*** with the use of ***LaTeX***. Took part in a formal presentation with the professor and client.

Design of an Anchor Windlass Gear Reducer | University of Ottawa, ON *07/2020*

- Designed a two-stage spherical-bevel and helical gearbox for an anchor windlass by modelling the gearbox casing, shafts, and sourcing suitable gears and bearings in ***SolidWorks***. Used ***machine element design*** fundamentals to model and mount shafts, gears and bearings following ***design for assembly (DFA)*** principles.
- Optimized the gearbox configuration by considering compactness, noise, weight, cost, efficiency, durability and maintenance in a ***decision matrix*** and ensuring feasibility through extensive calculations and analysis of gear forces and torques, bending fatigue, gear ratios and safety factors. Presented the analysis in a ***50-page technical report***.

Design of a Portable Ziplining Device | University of Ottawa, ON *01/2019 – 04/2019*

- Conceived a novel portable ziplining device that can be used from tree to tree without the need for preinstalled ziplines. Led the development of initial concepts by brainstorming the overall design and functionality of the device, making detailed ***2D & 3D hand sketches*** and using ***weighted decision matrices*** to evaluate design ideas.
- Managed time effectively by developing a ***Gantt chart*** to plan objectives and deadlines, coordinating design elements with team members, and organizing team design reviews to discuss ideas and challenges.
- Designed the casing, zipline launching barrels and triggers using ***SolidWorks*** while sourcing a number of complex components. Presented the project to the class and professor and obtained an A+ final grade.

LANGUAGES

English
Bilingual Proficiency

French
Native Proficiency

INTERESTS

Tennis | Ultimate Frisbee | Alpine & Cross-Country Ski | Karate | Sailing | Gym | Investing

REFERENCES

S&R Mechanical: *Miguel Botero | CAD Manager |* *Contact information available upon request.*

AEPONYX: *Cédrik Coia, Ph.D. | R&D Team Leader |* *Contact information available upon request.*