Nigel Swab

403-869-7695 | nigelswab@gmail.com | https://www.linkedin.com/in/nigel-swab/ | Portfolio

EDUCATION

Bachelor of Engineering – Mechanical Engineering | University of Victoria
Graduation: December 2021 | GPA: 7.2

Relevant Courses*:* Modal Mechanical Vibration; Mechatronics; Computer-Aided Manufacturing.

WORK EXPERIENCE

Test Engineering Co-op | January 2021 – August 2021
Zaber Technologies Inc. | Vancouver, BC

- Developed and executed test plans, documenting results for several electromechanical devices.
- Improved the speed and thrust capabilities of thrust testing apparatus by 55% and 150% through electromechanical design, component specification, and Python scripting.
- Identified a manufacturing issue with thrust bearing pre-load through testing and analysis.
- Reduced setup times for multiple tests by designing and manufacturing laser cut jigs and stoppers.

Mechanical Engineering Co-op | September 2020 – December 2020
ViVitro Labs Inc. | Victoria, BC

- Designed, specified, and tested a high-speed camera system (lens, mounting, lighting) for simple and repeatable installation across multiple prosthetic heart valve accelerated wear-testers.
- Created, reviewed, and submitted drawings for manufacturing using SolidWorks.
- Designed, manufactured, and tested fluid flow and compliance modifications to reduce hydraulic shock in prosthetic heart valve accelerated wear-tester.

Machine Shop Co-op | May 2019 – August 2019
University of Victoria | Victoria, BC

- Manufactured parts and assemblies with high precision using CNC/manual mills and lathes, laser cutters, water jets, and laser welding machines.
- Collaborated with professors, undergraduate, and graduate students to design manufacturable parts and produce quality drawings for projects and experiments.

Industrial Engineering Co-op | September 2018 – December 2018
Department of National Defence | Esquimalt BC

- Designed and oversaw the production of steel engine mounts for 5850 kg diesel generators using SolidWorks, FEA, and mechanical calculations.
- Cooperated with a manufacturer to design an acid wash rinse tank with a counter-flow baffle system in SolidWorks.
- Contributed to the implementation and documentation of a new labeling system for the central storage facility using AutoCAD.

STUDENT CLUB EXPERIENCE

Chief Engineer | June 2020 – June 2021
UVic Formula Racing (UVic FSAE) | Victoria, BC

- Organized and ran design reviews to ensure design integrity and vehicle system integration.
- Oversaw and approved major design decisions, drawings, and manufacturing processes.
- Helped initiate and manage the development of the team's first fully electric vehicle.

Vehicle Dynamics Lead | May 2018 – June 2020
UVic Formula Racing (UVic FSAE) | Victoria, BC

- Directed and mentored up to 15 students at a time through verbal and written communication.
- Drove the transition to 10" wheels and the subsequent suspension redesign.
- Oversaw and coordinated vehicle testing and data acquisition.

SKILLS

Manufacturing/Design: CNC/manual mills and lathes, laser cutters, water jets, laser welders, carbon fiber layups, design for manufacture and assembly, engineering drawings, Finite Element Analysis (FEA).

Programs/Languages: SolidWorks (Certified Associate – Mechanical Design), SolidWorks PDM, Mastercam, HSM Works, git, Python, MATLAB, C, G-Code, HTML, CSS.

Data/Electrical: Data analysis, basic sensor instrumentation, soldering, basic circuit design, basic signal processing, firmware development, PID design and tuning.

TECHNICAL PROJECTS

Electric Vehicle Drivetrain – *UVic FSAE* | March 2021 – Present

- Specified and analyzed the drivetrain type (chain) and final drive ratio using a weighted objectives chart and vehicle dynamics calculations in MATLAB and Excel.
- Currently designing/specifying all components between the motor and the differential, including a splined stub-axle, two custom sprockets, a spline adapter, and motor/differential mounting.

Autonomous Seafloor Imaging Towfish - *Capstone Project* | January 2021 – April 2021

- Collaborated with 4 students to design, manufacture, and test a semi-autonomous seafloor imaging towfish capable of depths up to 100 meters.
- Integrated a Raspberry Pi, Arduino UNO, and several electrical components and sensors to control and communicate with the towfish through a 100-meter ethernet cable.
- Created a multi-threaded Python program capable of updating PID values on the Arduino through a GUI while logging data from to auto-generated CSV files.

Wheel Change and Suspension Redesign - *UVic FSAE* | January 2019 – December 2019

- Led the team to transition from 13” wheels to 10” wheels by creating and comparing semi-empirical tire models, running simulation sweeps, and presenting the costs and benefits.
- Designed the steering geometry, suspension kinematics, damper packaging, rear tie-rod pickups, and rear anti-roll bar using kinematic software, SolidWorks, and Excel.
- Collaborated on the design of the uprights, outboard suspension nodes, front-anti-roll bar assembly, and adjustment interfaces.

CORE COMPETENCIES

Continuous Learning	- Joined UVic Formula Racing in the first week of university to grow and gain hands-on experience outside of the classroom. - Member of SAE and EGBC. - Attained 24 months of internship experience during degree (16 required).
Communication Skills	- Work term report on engine mount design nominated for the University of Victoria Co-op Work Term Report Award (2018). - Attained top scores for design presentations to industry experts in 3 FSAE competitions, placing 9th out of 120 teams in 2018.
Project and Task Management	- Comfortable with prioritizing and managing competing tasks with experience as a UVic FSAE Team Lead and Chief Engineer - Successfully balanced a full-time internship, FSAE Chief Engineering duties, and a 4-month capstone project simultaneously.

REFERENCES

Nathan Paolini	**Ian Chen, Ph.D.**	**Dr. Stephanie Willerth**
Test Engineering Lead	Engineering Manager	Full Professor and Canada Research Chair in Biomedical Engineering
Zaber Technologies Inc	ViVitro Labs Inc.	University of Victoria
(778) 875-5784	(250) 288-3531 ext. 294	(250) 721-7303
npaolini@zaber.com	ichen@vivitrolabs.com	willerth@uvic.ca