Ethan Alexander

Mechanical Engineer in Training

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Skills and Certifications

Electrical
- Soldering
- Circuit prototyping
- Microcontrollers
- Electrical Drafting
- Panel Wiring
- Signal Processing

Mechanical
- Machining
- Welding
- Hand tools
- 3D Printing
- P&ID diagrams
- GD&T drafting

Simulation/CAD
- Ansys
- Siemens Simcenter
- Solidworks
- CREO PTC
- DraftSight
- FEMM

Programming
- C++/C#
- MATLAB
- Python
- PLC Ladder Logic
- LabVIEW
- LaTeX

AI/ML
- Python ML
- AI Predictive Maintenance
- Google TensorFlow
- Matlab Optimization

Certifications
- EGBC EIT
- BCDL Class 5
- WHMIS
- Certified Solidworks Professional
- Ansys Maxwell

Education

University of British Columbia — *May 2023*
Bachelor of Applied Science - Mechanical Engineering Co-operative Education Program — AVG. 78.5%

Langara College — *May 2019*
Certificate in Arts and Sciences (Engineering) — AVG. 3.7 GPA

Technical Work Experience

Electrical-Mechanical Engineering Co-op — *Apr – Aug 2022*
Westport — Vancouver, BC
- Calibrated test benches pressure, temperature, and flow rate sensors.
- Tested a system to cool hydraulic fluid with liquid nitrogen to estimate the cooling potential and create an efficient control system.
- Programmed and installed a temperature control and safety system into a gas quality monitoring enclosure.
- Programmed and designed a pressure control system for a long-term pressure testing system that did not include a regulator.
- Designed UI's in LabVIEW to make it easy for the rig operator to configure during use.

Product Design Engineering Co-op — *Aug 2021 – May 2022*
LTL Munitions — Richmond, BC
- Performed stress and physics calculations for a non-engineering designer to guide his design toward a functional prototype.
- Created a program to predict the performance and a pneumatic system to determine the acceleration of a piston.
- Manufactured a system prototype to determine if the performance met the client's standards.
- Created mechanical drawings for manufacturing using GD&T.

Product Design Engineering Co-op — *May 2020 – May 2021*
Dometic — Richmond, BC
- Performed product feasibility studies of multiple solutions that would set us apart from competitors' solutions.
- Performed in-depth analysis of our prototype to determine an accurate prediction of real-world performance.
- Evaluated multiple electromagnetic simulation software packages by comparing ease of use and accuracy to real-world data collected from test benches I designed.

Technical Projects

Capstone: Predictive Maintenance of an Air Compressor — *Sep 2022 – Apr 2023*
UBC — ealexander.ca/ubc-capstone
- Researched and evaluated failures in portable air compressors based on user experience to determine the most probable failures.
- Researched and selected sensors that could record possible indicators of failure.
- Designed and programmed a data custom data recording script that records signals from multiple devices into a single database.
- Programmed database access into an LSTM neural network.

Drone Escort Project — *Jan – Apr 2023*
UBC — ealexander.ca/drone-escort
- Designed and programmed a second-order stiffness base robotics controller to mesh with a built-in position-based PID controller.
- Created an object avoidance system between the drones that minimized the impact of prop wash.
- Tested and tuned the system to minimize the error in the drone's position.

Stress Relaxation in 3D Printing Materials — *Feb – Apr 2022*
UBC — ealexander.ca/stress-relaxation
- Designed a mounting and measurement system that could record the change in stress of a length of filament under constant strain.
- Designed and programmed a MATLAB script that could automatically process and fit curves to the raw data to compare materials.

Student Teams

UBC Aerodesign — *Sep 2019 – May 2021*
Member of Advanced Payload and Glider Sub Team — Vancouver, BC
- Designed a release and mounting mechanism to mount unpowered gliders to a larger plane.
- Performed simulations on the glider to optimize the mounting position to minimize forces and torque on the mounting system.
- Designed the internal structure of the glider based on the CAD provided by the CFD analysis team.