Ben Roberts

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Education

University of Victoria **Sep. 2021 – May 2026**
Bachelor of Mechanical Engineering, GPA: 3.67 / 4.0 *Victoria, BC*

Relevant Coursework

- Mechanics of Solids
- Properties of Materials
- Engineering Drawing
- Thermodynamics
- Data Structures
- Linear Algebra
- Control Theory
- Precision Machining

Experience

BC Cancer Research, Aparicio Lab **September 2023 – May 2024**
Mechatronics Engineer Co-op Student *Vancouver, BC, Canada*

- Designed, built, and programmed advanced fluidics and imaging systems for cancer research experiments.
- Developed a fluidics system, fluid chamber, and custom cover slip shaker for Expansion Sequencing (Ex-SEQ) using SolidWorks, 3D printing, Python, and C++.
- Created a MATLAB-based acquisition system for precise imaging and analysis of cancer cells, programming lasers, stepper motors, cameras, and microscopes for chip scanning and cell viability analysis.
- Enhanced the syringe pump for Multiplexed Error-Robust Fluorescence In Situ Hybridization (MERFISH) by increasing its flow rate and volume capacity using C++, MATLAB, Solidworks, and 3D printing.
- Utilized MATLAB and Java for image analysis and classification, exporting data for further bioinformatics analysis.

SMcN Consulting Inc. **January 2023 – April 2023**
Design Engineer Co-op Student *Langford, BC, Canada*

- Enhanced Revit skills through involvement in various Boiler Plant and HVAC upgrades projects.
- Calculated airflow requirements while designing HVAC systems on multiple projects.
- Conducted multiple energy studies using the Hourly Analysis Program (HAP).

Herold Engineering LTD. **May 2022 – Aug 2022**
Civil Engineering Co-op Student *Nanaimo, BC, Canada*

- Used AutoCAD to create a library of drop-down pipe details.
- Created and modified spreadsheets with integrated macros for precise flow rate calculations.
- Assisted and completed multiple surveys, exporting data to create surfaces in CAD.

Projects

DLP Acquisition and Analysis System | *MATLAB, Java, Python, SolidWorks*

- Developed a system to scan and analyze a 72x72 chip containing cancer cells, determining viability.
- Programmed lasers, stepper motors, camera, and microscope for precise image capture.
- Used MATLAB and Java for image analysis and classification of cells as alive or dead.
- Created a tile view of pseudo-color images for manual verification and adjustment.
- Exported analyzed data to Excel for further bioinformatics analysis.

Centrifugal Clutch | *SolidWorks*

- Designed a Centrifugal Clutch in SolidWorks based on calculations and engineering principles.

Custom Cover Slip Shaker and Mount | *SolidWorks, C++, Python*

- Designed and 3D printed a custom cover slip shaker and mount.
- Programmed functionality using C++ and Python.

AI Golf Coach (In Progress) | *OpenCV, YOLOv5, PyTorch*

- Developing an AI to analyze golf swings using computer vision and neural networks.

Technical Skills

Languages: C, C++, Java, JavaScript, Python, HTML & CSS, Matlab, Robot C, R
Frameworks and Programs: SolidWorks, AutoCAD, Revit, Simulink, Matplotlib, Jupyter Notebook, RStudio, Visual Studio Code IDE, OpenCV, Tkinter, Pandas

Awards

Maurice Summerhayes Memorial Scholarship: University of Victoria, 2021 - Present
Major W. Horan Memorial Scholarship: University of Victoria, 2021