Callum Hepworth

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Education

University of British Columbia — Vancouver, BC
Bachelor of Applied Science, Engineering Physics — *Sept. 2018 – Present*

- Cumulative GPA: 3.90/4.00
- Projected Completion: April 2023

Work Experience

Catastrophe Modeling Application Developer — January 2020 – December 2020
Validus Research, Inc. — *Waterloo, ON*

- Designed and expanded internal-facing web application in **Vue.js** to streamline analyst workflow, significantly reducing work overhead for the creation and maintenance of new and existing projects
- Developed UI and data pipeline allowing analysts to retrieve, format, and display analytics data from multiple sources, facilitating an intuitive comparison of varied client information
- Built **Flask API** in **Python** to allow for retrieval of relevant data from a SQL server, exporting formatted and cleaned project data to customized .xlsx file
- Returned after initial four month internship (January - April) on a part time basis starting in July 2020

Projects

Particle Simulation and Reconstruction Framework — September 2021 – Present

- Developed user-facing **Python** wrapper for **Docker** deployed **C** program used to generate simulated datasets of particles imaged through cryogenic electron microscopy, improving runtimes to adequately handle large workloads
- Implementing iterative refinement algorithm to reconstruct simulated 2D datasets into 3D particles, leveraging academic literature to benchmark performance
- Upheld best software development practices, including maintaining a rigorous test suite in **pytest** with minimum **90%** code coverage, to facilitate extensibility of open-source project repository

Autonomous Robot Control | *ROS, Neural Networking, Computer Vision* — September 2020 – December 2020

- Using the **ROS** framework, developed a simulated robot in **Python** and **C++** capable of autonomously navigating a competition surface
- Designed an image capture algorithm to reliably record the license plates of passing vehicles, subject to a SIFT keypoint match threshold
- Planned and implemented a convolutional neural network using **TensorFlow** and **Keras** to classify characters from license plate images, achieving **99%** classification accuracy on test dataset

hireflow - Recruitment Management App — September 2020 – December 2020
UBC Launch Pad — *Vancouver, BC*

- Worked toward creating a recruitment management platform to streamline the hiring processes of university clubs and organizations
- Collaborated with design team to wireframe and implement the application dashboard and corresponding navigation panel using **TypeScript** and **React.js**
- Implemented backend user model to hold client login information using **Express.js** and **MongoDB**, testing required API routes using **Postman**

Technical Skills

Languages: Python, JavaScript, HTML/CSS, Java, C/C++
Frameworks: Vue.js, Flask, JUnit
Developer Tools: Git, VS Code, Visual Studio, JetBrains IDE Suite, Microsoft Office Suite
Libraries: SciPy, NumPy, Matplotlib, OpenCV, TensorFlow, Keras