

Alex Vanderhoeff

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EDUCATION

Western University

2020 – 2022

Master of Science, Geophysics, Cumulative GPA: 3.9.

London, Ontario, Canada

- Collaborative Specialization in Multi-Hazard Risk and Resiliency.
- Western Graduate Research (WGR) Scholarship.

Western University

2015 – 2020

Bachelor of Science, Honors Specialization in Geophysics, Major GPA: 3.7.

London, Ontario, Canada

- Gold Medal for Honors Specialization in Geophysics, 2020.
- Dean's list, 2017-2020.
- Geophysics Award for Excellence, 2018.

WORK & RESEARCH EXPERIENCE

Western University

London, Ontario, Canada

Computational Seismology Research Fellow

September 2020 – Present

- As a research fellow, I run large finite difference numerical simulations on the supercomputer SHARCNET that simulate earthquake ground motions. I am also creating a semantic image segmentation convolutional neural network to create a shear wave velocity model of the subsurface. Other accomplishments include:
 - K-means cluster analysis of historical earthquakes located offshore Vancouver.
 - Wrangling and cleaning a large soil dataset to convert data into the proper format.
 - Produced documentation of the earthquake numerical simulation code used.
 - Ran numerical simulations to determine the effect of topography on ground motions.

Graduate Teaching Assistant

September 2020 – Present

- Designed and lead lab sessions teaching students about geophysical surveys and geophysical data processing.
- Provided students with tutorials in MS Excel and MATLAB during lab sessions and office hours.

High Pressure-High Temperature Physics Researcher – Thesis Project

September 2019 – May 2020

- Designed and machined an innovative cubic cell for high pressure, high temperature experiments.
- Experimentally measured thermal conductivity of an Iron-Nickel alloy and calculated heat flow in the Moon.

Undergraduate Geophysics Student Researcher

October 2017 – May 2018

- Contributed to the development of an SQL geodatabase of geophysical data for the Vancouver project.

DATA SCIENCE PROJECTS & EXPERIENCE

- Graduate data science course; data analysis and signal processing course.
- K-means clustering analysis of earthquake epicenter data near Vancouver.
- Semantic image segmentation CNN to compute shear-wave velocities from dispersion images (in progress).
- Linear regression to predict earthquake magnitude recurrence relations for Vancouver.
- Artificial and convolutional neural networks to predict home prices from mixed inputs.
- Random forest regression and boosted regression models to predict appliance energy usage.
- Artificial neural network and logistic regression is to predict whether a patient went on to develop coronary heart disease (CHD) in a 10-year period or not.

SKILLS, COURSEWORK & INTERESTS

- **Skills:** Python; MATLAB; SQLite; Linux; GitHub; TensorFlow; Keras; Pandas; NumPy; SKlearn; Tableau; MS Office.
- **Coursework:** Data Science & Machine Learning; Data Analysis & Signal Processing; Partial Differential Equations; Linear Algebra; Vector Calculus; Quantum Mechanics; Electrodynamics; Numerical Simulations of Waves.
- **Interests:** surfing; yoga; diving; hiking; guitar; ukulele; Seinfeld; Marvel; Cobra Kai; Rick and Morty; weightlifting.