

Malcolm Newson

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github.com/malcolmnewson
<https://malcolmnewson.github.io>

Education

University of Victoria | 2013 - 2019 | *Victoria, B.C., Canada*

BSc Physics | *Minor Software Development* | *Co-op Physics*

Programing languages:

MATLAB, Python, Java, C, R, Bash

Technologies:

Linux, Excel, Pandas, NumPy, Scikit Learn, Git,
Slack, OneNote, LaTeX, Weka, SQL

Experience

Redlen Technologies - Research and Development Lab Technician

November 2018 - August 2019

- Designed and implemented a study of how different metal contacts and surface preparation techniques affect the output characteristics of the detector, improving yields, and reducing costs.
- Safely operated high voltage x-ray machines to test semiconductor detectors; related results to the underlying detector physics, and troubleshooting code and hardware when necessary.
- Developed a script in Python that automated repetitive manual labor by collecting large numbers of data files for post-processing and analysis.
- Worked in a Class 10000 cleanroom doing photolithography, chemical metalization, and wet etching.

Geological Survey of Canada - Geodynamics Computer Modeling Assistant

January 2018 - April 2018

- Processed remote sensing GPS data into time series; used Python to apply corrections and analyze outputs.
- Displayed resilience in a research environment where changing priorities and unexpected problems required strong personal management, communication, detailed documentation, and verification tests.
- Communicated with professional scientists and independently managed project work; used Secure Shell (SSH) to remotely access data, run software, and analyze results.

ASL Environmental - Data Analyst/Processor - ECO Grant recipient

September 2017 - December 2017

- Processed and analyzed physical oceanography time series data sets using inhouse MATLAB tools to consolidate multiple sensor signals into a concise, quality-controlled product.
- Received and incorporated constructive feedback from reviewers to maintain high standards of quality; demonstrating accountability, honesty, and responsibility.

XCITE Lab - Student Volunteer - Supervisor: Magdalena Carter, Ph.D., University of Victoria

January 2016 - August 2016

- Developed and tested a MATLAB simulation to investigate metal artifact reduction and scan time reduction in Computed Tomography (CT) images, resulting in a publication: DOI:[10.1002/mp.13291](https://doi.org/10.1002/mp.13291).

Continued

Academic Studies

- Applied physical principles to understand medical imaging and earth science systems while processing and analyzing data collected from technical sensors.
- Applied Data Mining techniques including supervised machine learning (classification and regression), clustering, text analysis, and recommendation systems.
- Software development experience writing modular, flexible, and robust code. Familiar with searching and sorting algorithms, data structures, classes, and objects.
- Rigorously explored mathematical topics: Linear Algebra, Calculus, Differential Equations, Complex Numbers, Numerical Analysis, Statistics, and Time Series Analysis.
- Extensive and varied coursework in physics topics: Medical Physics, Geophysics, Fluid Dynamics, Nuclear, Quantum, Particle, Solid State, Classical Mechanics, E&M, and Optics.
- Completed software and computer science classes covering Data Mining, Security Engineering, Simulation, software development methodologies, testing, and architecture.
- Applied Numerical Analysis techniques including interpolation, integration, ordinary differential equations, error analysis, finding roots of equations, and systems of linear equations.

Projects | <https://github.com/malcolmnewson>

Data Mining: Completed a Data Mining project in Python with Pandas, NumPy, and Scikit Learn: using classification evaluation metrics to assess the quality of different classifier algorithms and attribute combinations.

Fluid Dynamics: Designed and implemented a study of airflow around an airfoil: setting the parameter space with simulations, building the airfoils and data collection mechanism, analyzing the data, and presenting results.

Simulations: Coded and evaluated a network simulation using Java that implemented a priority queue to alleviate the problem of packet reordering in a simple source, router, and destination model.

Software Architecture: Contributed to a group software architecture project that developed a web application for tracking expenses using Typescript, node.js, express.js, MongoDB, and HTML.

Time Series Analysis: Analysed temperature data for the South Vancouver Island area using time series techniques including cross lag correlation, Fourier transformations, and filters, as well as spatial data analysis with Principal Component Analysis.