Nathalie Redick

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Education

McGill University (3.75 / 4.00) *Montréal, QC* | Sep. 2019 – May 2023

- B.A. in **Computer Science**, Minor in **Earth & Planetary Sciences** & Supp. Minor Conc. in **Computer Science**.
- *Relevant Courses*: Algorithms & Data Structures, Data Science, Linear Algebra I & II, Discrete Math, Probability, Statistics, Applied Machine Learning, Probabilistic Programming.

Skills

Languages: Python, Julia, C++, C, Java, DB2/SQL/MySQL, R, Bash, MATLAB, HTML/CSS, OCaml, MIPS Assembly.
Tools: Git, Linux/Unix, LaTeX, Jupyter, AWS EC2, VS Code, Numpy, Pandas, Tensorflow, PyTorch, RESTful APIs, MongoDB.

Experience

Technology Analyst @ *Morgan Stanley* *Montréal, QC* | Aug 2023 – Present

- Currently enrolled in the Technology Analyst training program (TAP).

Data Science Intern @ *Esri* *Remote* | May 2022 – Aug. 2022

- Implemented an automated workflow for updating national hydrography datasets using the Multi-Task Road Extractor **deep learning** model.
- Improved the baseline model by $\sim 4\%$ accuracy to **96.3% accuracy & 0.85 MIOU** by designing new input image layers & geomorphological indicators.

Software Engineer Intern @ *Blue Spiral Interactive/Albany IT Group* *Saratoga Springs, NY* | Jun. 2019 – Aug. 2019

- Improved in-house marketing analysis software by working with a team to build a **RESTful API** for visualising data.
- **Self-taught** Python, Git, & QGIS over the course of the internship. I used parallel computing techniques to **reduce execution time by 97%**.

Research

Machine Learning For Geospatial Analysis | *McGill University* Sep. 2022 – Present

- Creating a guided machine learning workflow for geospatial analysis.
- Our objective is to create a tool that can be used by anyone, regardless of their technical background.

Using U-Net to Identify Landslides | *McGill University* May 2021 – Present (On Hiatus)

- Implementing an image segmentation ML model to identify landslides using geophysical indicators.
- Current interation of the model boasts **95.3% accuracy & a loss of 0.19.**

Awards

- Won both **Best Design & Most Fun & Creative Game Dev Hack** against 332 participants at McHacks9 for Pan(demic)-Man, a COVID-19-themed Pac-Man webGL game built with *Unity Game Engine* & C#.

Geotop 2021 Scholarship Competition *($1500)* *Geotop* | 2021

- Selected based on my research proposal to *Use ML to Indentify Landslides* & academic performance.

Alma Mater Scholarship *($3000)* *McGill University* | 2019

- Entrance bursary to McGill University for academic excellence.

Extra-curriculars

Vice President Communications | *The Monteregian Society at McGill University* Sep. 2020 – Apr. 2023

- Managed communications for the undergraduate student council for Earth & Planetary Sciences.
- Designed & built the council's website to host student resources, events, & other information.

Member | *Machine Learning for Geoscience Reading Group at McGill University* Jan. 2021 – May 2021

- Participated in an informal reading group to examine current papers in ML applications in the geosciences.

Professional Development

SCIWS12 Tutorial on Machine Learning & Deep Learning | *American Geoscience Union* Dec. 2020

- Attended a technical workshop on machine learning & deep learning for the environmental & geosciences.

MAIS 202: Accelerated Introduction to ML | *McGill Artificial Intelligence Society* Jan. 2020 – Apr. 2020

- Selected through a technical interview to participate in a 12-week accelerated course of ML.
- **Webscraped data** to train a **CNN** to classify geologic sample images into 4 classes; deployed as a webapp.

Publications & Presentations

1. Redick, N. R. (2024, January 23). Code-Free Deep Learning for Geospatial Applications. AGU23, Venue 5, Science Nexus (Online Only). agu.confex.com/agu/fm23/meetingapp.cgi/Paper/1366363
2. Redick, N. R. (2023, April 11). Building an Accessible Machine Learning Workflow for Geospatial Analysis. Open Research Symposium, McGill Library, Montréal QC.
3. Redick, N. R. (2023). A Review of Pumice Raft Formation Environments, Saturation, and Dispersal Mechanisms. McGill Science Undergraduate Research Journal, 18(1), Article 1. doi.org/10.26443/msurj.v18i1.187