Nathalie Redick

Davis, CA | +1 (518) 410-4084 | nrredick@ucdavis.edu | nredick | nredick | 0009-0005-5028-5299

Education

University of California, Davis, *Davis, CA* | MSc Geophysics — 4.00/4.00 | September 2024 – June 2026

McGill University, *Montreal, QC* | BA Computer Science — 3.75/4.00 | September 2019 – August 2023

- Minor in Earth & Planetary Sciences, Supplementary Minor Concentration in Computer Science (Machine Learning)

Research

Machine Learning For Geospatial Analysis — September 2022 – July 2024
McGill University — *Montreal, QC*

- Designed a guided machine learning workflow for geospatial analysis.

Using U-Net to Identify Landslides — May 2021 – August 2022
McGill University — *Montreal, QC*

- Implemented an image segmentation ML model to identify landslides using geophysical & morphological indicators.

Undergraduate Research Assistant — January – August 2021
Earthquake Processes Research Group, McGill University — *Montreal, QC*

- Individually designed & built a website using **HTML/CSS & JS** to communicate seismological data of Québec to promote public awareness about local earthquake hazards.

Work Experience

Technology Analyst — July 2023 – August 2024
Morgan Stanley — *Montreal, QC*

- Worked collaboratively to provide agile metrics analysis for internal dev. teams globally, user support, & documentation.
- Utilized DB2 SQL, MongoDB, & Python to process metrics & maintain project infrastructure.

Data Science Intern — May – August 2022
Esri Canada — *Remote*

- Automated a workflow for updating national hydrography data using the Multi-Task Road Extractor **deep learning** model.
- Designed new input image layers & geomorphological indicators that improved the baseline model accuracy by ∼4%.

Software Engineering Intern — June – August 2019
Blue Spiral Interactive/Albany IT Group — *Saratoga Springs, NY*

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

Field Work

Graduate Volcanology Seminar @ McGill University — *Long Valley Caldera, CA* | October 2022

- Participated in a 1-week field seminar to study the volcanological features & history of the Long Valley caldera in California.

Field School I @ McGill University — *Death Valley, CA* | May 2021

- Produced maps of geologic units & structures in both Rainbow Basin, CA & Dublin Gulch, CA over 2.5 weeks.
- Gained experience with field mapping, using a Brunton compass, & topographic maps.

Teaching Experience

GEL 101L: Structural Geology Lab (TA), University of California, Davis — January – March 2025

- Led 6 hours a week of lab on upper-division undergraduate structural geology concepts & field techniques.
- Helped run two field mapping excursions.

GEL 50L: Physical Geology Lab (TA), University of California, Davis — September – December 2024

- Led 6 hours a week of lab on introductory geologic concepts & field techniques.
- Developed lecture slides, helped lead a field trip, and responsible for grading.

Awards

Bogo Hack, MAIS Hacks 2022 — 2022
Best Design & Most Fun; Most Creative Game Dev Hack, McHacks9 — 2022
Best AI Hack for Art, MAIS Hacks 2021 — 2021
Geotop 2021 Scholarship Competition, Geotop ($1500) — 2021
Best Overall Hack, MAIS Hacks 2020 — 2020
Alma Mater Scholarship, McGill University ($3000) — 2019
Stat Staff Professionals Computer Science Scholarship, Saratoga Springs High School ($1000) — 2019

Certifications

Wilderness First Aid, Sierra Rescue (Expires November 2027) — November 2024
Epinephrine Auto-Injector Administration, Sierra Rescue (Expires November 2026) — November 2024
Adult Child Infant CPR/AED & First Aid, Sierra Rescue (Expires November 2026) — November 2024

Skills

Programming Languages: Python, Julia, C++, C, Java, DB2/SQL/MySQL, R, Bash, MATLAB, HTML/CSS, OCaml, MIPS Assembly
Tools: Git, Linux/Unix, LaTeX, Jupyter, QGIS/ArcGIS, HPC, Slurm, AWS EC2, VS Code, RESTful APIs, MongoDB, Jira, Jenkins, Liquibase

Extra-curriculars & Outreach

Field Trip Activity Leader January 2024–Present
UC Davis *Davis, CA*
- Facilitated an interactive learning activity in the rock garden for visiting 6th-grade students.
- Engaged students in educational discussions and hands-on experiences about characteristics of the 3 major rock types.

AWG Student Mentor January 2024–Present
Association of Women Geoscientists (AWG) at UC Davis *Davis, CA*
- Assist a student in learning new skills, building job applications & resumes; discussing the science field & graduate school.
- Guide the student in developing an exploratory research project in the geosciences.

Datalab Affiliate October 2024–Present
UC Davis Datalab *Davis, CA*
- Participate & assist in workshops related to data science & computational pedagogy.

Vice President of Communications September 2020 – April 2023
The Monteregian Society *Montreal, QC*
- Managed communications for the undergraduate student council for Earth & Planetary Sciences at McGill University.

Professional Development

Instructor Training: Introduction to Computational Pedagogy December 2024
UC Davis Datalab *Davis, CA*
- Two-day workshop on evidence-based teaching, inclusive pedagogy, and instructional design for computational skills.
- Strategies for teaching students from non-computational backgrounds, designing inclusive learning environments, and adapting to in-person/virtual/hybrid formats.

SCIWS12 Tutorial on Machine Learning & Deep Learning December 2020
American Geoscience Union *Virtual*
- Attended a full-day technical workshop on machine learning & deep learning for the environmental & geosciences.

Accelerated Introduction to ML January – April 2020
McGill Artificial Intelligence Society *Montreal, QC*
- Selected through a technical interview to participate in a **10-week** accelerated course of ML.

Publications & Presentations

Redick, N. R., Tarling, M. S., & Kirkpatrick, J. D. (2024). Code-Free Deep Learning for Geospatial Applications. Retrieved October 6, 2024, from https://agu.confex.com/agu/fm23/meetingapp.cgi/Paper/1366363

Redick, N. R. (2023a, April 4). Building an Accessible Machine Learning Workflow for Geospatial Analysis. https://escholarship.mcgill.ca/concern/presentations/2n49t738j?locale=en

Redick, N. R. (2023b). A Review of Pumice Raft Formation Environments, Saturation, and Dispersal Mechanisms. *McGill Science Undergraduate Research Journal*, *18*(1), B19–B25. https://doi.org/10.26443/msurj.v18i1.187