
Machine Learning

PyTorch, Scikit-Learn, OpenCV,
PyMC3, Optuna

Programming / Geospatial

Python, GDAL, Shapely, Xarray,
NumPy, SciPy, Pandas, Anaconda

Computing

Linux, Bash, AWS, SQL/PostGIS,
Docker, Git, QGIS

EXPERIENCE

**Senior Machine Learning Scientist
Data Scientist**

Feb 2022 – Present
Sep 2020 – Feb 2022

Computational Geosciences Inc

- Deliver deep-learning mineral prospectivity mapping, as well as tailored machine learning models across the mining and energy sectors, working collaboratively with clients and an internal geoscience team.
- Improve internal deep learning methods by testing developments in areas such as unsupervised segmentation, graph neural networks, and data augmentation in collaboration with university partner.
- Develop deep learning systems from proof-of-concept to production; integrate with data fusion products assimilating geoscience data from local to continental scale.

Founder

July 2018 – Sep 2021

Inlet Laboratories

- Independent consulting on projects such developing a Bayesian time series forecasting system for a medical school, business process mapping of personally identifiable information flow through a Fortune 500 company, and technology evaluation for a leading mining company.
- Handled all aspects of a small business including sales, legal, and finance.

Co-Founder

July 2018 – Dec 2019

Prose AI

- Designed and optimized LSTM neural networks for real-time voice recognition in-browser and managed cloud infrastructure.

Postdoctoral Researcher

July 2017 – July 2018

University of Edinburgh

- Developed new ice-sheet model for uncertainty quantification of sea level rise due to mass loss from the Antarctic ice sheet.
- Finite element modelling of ice flow using the FEniCS library leveraging automatic differentiation for solving inverse problems and error propagation.

PhD Candidate

Oct 2013 – July 2017

University of Cambridge

- Quantified the partitioning of Greenland ice sheet melt among flowpaths by developing a hydrology model.
- Determined impact of increased surface melting on the Greenland ice sheet on ice-mass loss by developing and applying a coupled finite difference ice-flow and hydrology model to the Paakitsoq Region, Greenland.

Project Geophysicist

May 2011 – July 2013

Scott Geophysics Ltd

- Co-lead field teams collecting geophysical data in remote areas.

EDUCATION

University of Cambridge

Oct 2013 – July 2017

- PhD in Polar Studies. Thesis: “Modelling the impact of surface melt on the hydrology and dynamics of the Greenland ice sheet”

University of British Columbia

Sep 2006 – May 2011

- B.Sc. Honours Geophysics with distinction. Thesis: “Strain Localization and Bulk Rheology Variation in Partially Molten Rocks: Insight from Analogue Model Experiments of Polyphase Materials.”

PUBLICATIONS

- Koziol, C. P., et al. (2021) fenics_ice 1.0: a framework for quantifying initialization uncertainty for time-dependent ice sheet models, *Geoscientific Model Development*
- Koziol, C. P., & Arnold, N. (2018). Modelling seasonal meltwater forcing of land-terminating margins of the Greenland Ice Sheet, *The Cryosphere*
- Koziol, C. P., & Arnold, N. (2017). Incorporating modelled subglacial hydrology into inversions for basal drag, *The Cryosphere*
- Koziol, C., et al. (2017). Quantifying supraglacial meltwater pathways in the Paakitsoq region, *Journal of Glaciology*

INVITED SEMINARS

BGC Engineering

March 2020

- How machine learning and data science are becoming important tools in the earth sciences

Simon Fraser University

Oct 2018

- Modelling hydrological forcing of ice sheet velocities and uncertainty quantification of ice sheet forecasts

University of Cambridge

March 2018

- Modelling seasonal acceleration of land terminating sectors of the Greenland ice sheet margin

University of Zurich

Feb 2018

- Modelling hydrologically forced seasonal acceleration of the Greenland ice sheet margin

DATA STUDY GROUPS

University of Washington Waterhackweek

March 25 – 29, 2019

- Analyzed modelled past and future streamflows in the Pacific Northwest.

Alan Turing Institute Data Study Group

April 16 – 20, 2018

- Improved research group’s understanding of language recovery after a stroke using data analysis.