
Machine Learning

PyTorch, Scikit-Learn, OpenCV,
PyMC3, Optuna

Programming / Geospatial

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

Computing

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

EXPERIENCE

Senior Data Scientist

Sep 2023 – Dec 2023

Floodbase

- Developed methodology for integrating satellite flood measurements with modelled time series of flooding.

Senior Machine Learning Scientist

Sep 2020 – Aug 2023

Computational Geosciences Inc

- Delivered 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.
- Improved internal deep learning methods by testing developments in areas such as unsupervised image segmentation, graph neural networks, and data augmentation in collaboration with university partner.
- Developed deep learning systems from proof-of-concept to production; integrated with custom 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 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 ice sheet mass loss.
- 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

- Lead field teams collecting geophysical data in remote areas across Canada.

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.

PUBLICATIONS

- Koziol, C. P., & Haber, E. (2023). Semi-Automated Segmentation of Geoscientific Data Using Superpixels, arXiv
- 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.

