THE UNIVERSITY OF BRITISH COLUMBIA

Postdoctoral position: Combining physics-based and machine learning approaches for using electromagnetic data for detection and classification of unexploded ordnance (UXO)

University of British Columbia – Geophysical Inversion Facility

term: 2 years with the possibility to extend
preferred start: on or before Sept 1, 2025
salary: $70,000 CAD
location: UBC Vancouver campus
supervisor: Dr. Lindsey Heagy (lheagy@eoas.ubc.ca)

Description

Applications are invited for a two-year postdoctoral fellowship in applied and environmental geophysics. The main project will focus on the use of electromagnetic data for detecting and classifying unexploded ordnance (UXO). Specifically, this project will look at combining physics-based and machine learning approaches to develop an automated way to identify regions with a high density of metallic objects where traditional classification methods fail. This project builds upon our previous work in which we developed a workflow for the classification of UXOs based on convolutional neural networks (CNNs) and is a collaborative project with our industry partners at Black Tusk Geophysics.

As a postdoctoral researcher, you will have opportunities to collaborate with other researchers at UBC-GIF, working on a range of applications, including mineral exploration, carbon capture and storage, and environmental studies. Our group actively contributes to open-source software (SimPEG) and open educational resources (GeoSci.xyz). The successful candidate will have the opportunity to use and contribute to these projects and engage with other efforts to promote open science.

Equity and diversity are essential to academic excellence. An open and diverse community fosters the inclusion of voices that have been under-represented or discouraged. We particularly encourage applications from members of groups that have been marginalized on any grounds enumerated under the B.C. Human Rights Code, including sex, sexual orientation, gender identity or expression, racialization, disability, political belief, religion, marital or family status, age, and/or status as a First Nation, Metis, Inuit, or Indigenous person.

About UBC-GIF

The University of British Columbia Geophysical Inversion Facility (UBC-GIF) is an academic research unit within the Department of Earth, Ocean and Atmospheric Sciences (EOAS) at

UBC. Our research is methods-oriented and focuses on advancing numerical modelling, inversions, and machine learning for applied and environmental geophysics. We engage with industry collaborators in mineral exploration and with environmental firms. Our mission is to advance quantitative methods for using geophysical data to help solve problems that are important to society. We do this by: (a) developing methods in numerical simulations, inversions, and machine learning to extract insights from geophysical data, (b) advancing quantitative methods and tools that facilitate the integration of data, (c) maintaining and disseminating open-source software, and (d) training highly qualified geoscientists.

Requirements

- Motivated to use geophysical data for solving applied problems
- PhD in geophysics, physics, mathematics, computer science or related quantitative field
- Proficiency with programming. Python preferred
- Experience with numerical modelling
- Familiarity with inverse theory
- Experience with machine learning
- Familiarity with electromagnetic methods desired
- Capacity to lead projects with collaborators

Additional details

A description of benefits is available here:
https://hr.ubc.ca/working-ubc/faculty-titles-ranks-and-descriptions/postdoctoral-fellows

Application process

Please email Dr. Heagy (lheagy@eoas.ubc.ca) using the subject: **UBC-GIF postdoc application** and provide:

- a current curriculum vitae
- a short (1 page or less) description of research interests
- one recent publication
- names and contact information for 2 references (no letters necessary)

Review of applications will begin immediately and the position will remain open until filled.