

## Artificial Intelligence for Geological Mapping

### Code

20/02

### Company

Satellite Applications Catapult, Extractive Industries Value Stream

### Location

Harwell Campus, Didcot

### Project Description

Geological mapping from remote sensing has historically, and continues to, play a significant role in mineral exploration. Multispectral satellite data analysis provides a cost-effective, wide area approach to preliminary geological exploration. Whilst geological mapping is one of the more mature applications of earth observation there has been very little effort in automation of the processing and interpretation of the derived insights. In contrast, the application of latest analytical tools such as machine learning (ML) for landcover mapping using Earth Observation (EO) data is becoming more established and widely used. This presents an exciting opportunity to further the automation of lithological mapping and alteration anomaly analysis from EO. The combination of traditional remote sensing approaches with latest ML techniques could revolutionise the way we carry out geological exploration.

This project will look at the feasibility of combining state of the art ML techniques with traditional spectral approaches to automating elements of satellite-based geological mapping for mineral exploration.

The project aims include, but not limited to:

- Investigate the availability and generation of labelled training data for automated geological mapping
- Investigate the suitability of shallow and deep ML algorithms for geological mapping from EO imagery
- Other potential avenues to explore e.g. automating the use of digital elevation models for structural analysis

### Applicant Specification

- A successful student will be a numerate, have computing skill, able to critically evaluate problems, suggest solutions and show initiative in a supervised R&D project.
- Experience in one or more of the following areas are preferred: application development, geography, artificial intelligence, remote sensing, maths and geology.
- Students from any of the following or similar courses can apply – Geology/Earth Science, Remote Sensing, Engineering, Physical Geography, Computer Science, Mathematics

**Minimum Requirements**

Currently in first year of a STEM undergraduate degree.

**Preferred Additional Requirements**

General programming experience in high level languages such as python and/or JavaScript

**Application Closing Date**

5pm Monday 9 March

**Interview Dates**

19 & 20 March and 23 & 24 March

While sending in your applications, ensure you will be available for an interview for the days mentioned above.

**Start date & salary:**

The internship is for 8 weeks fixed term contract starting on 15 June 2020 and the salary is £1,500 per calendar month. The SPIN induction day will be on the start date.