

## **Project 18/19 - EO SPINtern**

### **Modelling the inundation extent of tailings dam failures using Earth Observation**

#### **Company Description**

The Satellite Applications Catapult is a not-for-profit company and one of a network of centres established by Innovate UK to accelerate the take up of emerging technologies. The Catapult is transforming the way the world uses satellite technology, enabling new business and improving people's lives. We are accelerating the growth of the UK space sector by: raising awareness and increasing demand for satellite-enabled services; making space technology more accessible and relevant; and helping businesses, entrepreneurs and innovators to overcome challenges and bring new products and services to market.

Working around the globe, the Catapult is bringing together multi-disciplinary and technical entities from government, industry and academic to deliver new innovative ideas and solutions for a variety of markets including agriculture, mining, transport, government services and maritime.

#### **Project Description**

The Extractive industries market is one of the key areas of focus within the Catapult's Sustainable Living Programme. We are currently working on a number of innovative projects around the world and the UK, developing Earth Observation (EO)-based monitoring and powerful visualisation capabilities for use across the mining sector. Tailings dams contain a slurry of harsh chemicals and harmful byproducts derived from mining activities, where its failure can cause long lasting damages to the environment and nearby populations. Shockingly, the failure rate of tailings dams over the last hundred years is over two orders of magnitude higher than the failure rate of conventional water retention dams (at 1.2% compared to 0.01%). Therefore, it is of utmost importance to monitor and identify the potential impacts of current tailings dam failures. The project aims include, but not limited to:

- Investigate the suitability of open source software based on digital elevation models for modelling different types of fluid flows (e.g. lahars as analogue)
- Compare EO-based modelling results to observed inundation extents of past tailings dam failures
- Generate a probability map of the risks and hazards to both the environment and any nearby population settlements associated with any future failures

#### **Applicant Specification**

Through working in a very dynamic and diverse environment within the Catapult and as part of the Earth Observation and Geospatial Systems and Solutions Teams the successful candidate will gain a variety of soft and technical skills. This are expected to include:

#### **Technical:**

- Familiarisation with GIS and image analysis tools stacks

- Familiarisation with a variety of optical and SAR EO datasets
- Access to the latest geospatial tools
- An understanding of the latest EO and geospatial developments shaping industry
- Understanding of key market problems the Catapult is working with industry to address

Soft:

- User centred design and requirements gathering
- Communication skills of dealing with a diverse set of technical, operational and sales stakeholders, including with international partners
- Project management

### **Minimum Requirements**

Applicants will need to have an understanding of EO data, have computing skill, be 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: geology, mathematics, remote sensing and GIS

### **Preferred Additional Requirements**

Knowledge/ experience of one of the Catapult Programme/ market areas would be advantageous

Target courses: Remote Sensing, Geology, GIS, Geography, Physics, Engineering, Mathematics and other similar courses

### **Closing Date**

Monday 14 May

### **Interviews**

Week commencing 21 May

### **Further Details**

8 weeks fixed term contract to be agreed with successful candidate but nominally with a start date around 18 June which is also the SPIN Induction day at Harwell. Salary is £1,500 per calendar month.

Apply on the website: <https://sa.catapult.org.uk/people/space-placements-industry-spin/>