

## **Artificial Intelligence and Earth Observation – Using the power of deep learning to improve satellite data products and applications**

**Code:** 20/09

**Company:** EarthWave Ltd

**Location:** Edinburgh

### **Company Description:**

Earthwave is a satellite data science company, specialising in Earth Observation, spatial data structures, system engineering and artificial intelligence. They are part of multiple Europe-wide consortiums, efficiently delivering reproducible scientific research and algorithm development using a wide range of satellite data, including Sentinel and CryoSat as well as other sources such as Airborne Lidar.

Experienced in working with multispectral, SAR and altimetry datasets to determine elevation, topography and deformation of the Earth's surface, Earthwave has been able to improve the accuracy of derived products through the use of artificial intelligence. Earthwave's novel approach to structuring spatial data allows fast slicing through space and time, providing the easy retrieval of Analysis Ready Data. This enables the fast fusion of large datasets, facilitating machine learning and other intensive computations.

[www.earthwave.co.uk](http://www.earthwave.co.uk)

### **Project Description:**

Earth Observation systems provide an immense amount of data daily. Due to its volume and complexity, it requires new techniques and methods to be exploited to extract valuable knowledge. Many companies are turning to artificial intelligence (AI) and machine learning (ML) algorithms to support their analysis or improve products.

EarthWave is building a scientific computing platform to facilitate data fusion and preparation of Earth Observation data for machine learning and are looking to realise a small demo project which uses parts of the platform. The proposed project consists of using our existing Neural Network (specifically designed for data captured by sensors) to improve current satellite data products and applications.

### **This will involve the following tasks:**

- Selection and processing satellite data using our scientific computing platform; gathering and selection of training data sets
- Using (and building up on) our in-house Neural Network to improve current satellite data products and applications
- Interpretation of results

- Presenting findings and ideas (e.g. writing a blog post on our website, creating a visualisation or giving a small presentation)

The candidate will have the opportunity to work with us in the Higgs Centre for Innovation space incubator between other start-ups in the space sector and academics. It is expected that she/he will acquire and improve the following skills during the project:

- Experience in working with a range of different satellite data sets and using standard data formats in the field of Earth Observation
- The opportunity to gain real-world experience in using deep learning within the field of Earth Observation
- Improving programming skills and knowledge of Machine Learning frameworks
- Working with large datasets
- Time management, communication and team work in a company environment

Additionally, she/he will have the opportunity to improve her/his presentation skills, for example by holding a presentation about the findings in front of other start-up companies and academics in the Higgs Centre for Innovation using our 7.5m wide, 4k big data visualisation facility

#### **Applicant Specification:**

We are looking for a motivated candidate with Machine Learning experience who enjoys challenges and being outside of their comfort zone.

#### **Minimum Requirements:**

- BSc (obtained or expected) in Computer Science, Informatics, Mathematics or other relevant degree
- Good programming knowledge (preferably python)
- Machine Learning experience (e.g. TensorFlow or PyTorch)

#### **Preferred Additional Requirements:**

- Analytically minded and creative
- Good communication skills and ability to work independently
- Experience or interest in working with Earth Observation data

#### **Further details:**

8 weeks minimum fixed term contract to be agreed with successful candidate but nominally with a start date around 17 June 2019 to attend the SPIN Induction day at the Satellite Applications Catapult, and completion before 20 September for the Showcase the following week. Salary is £1,500 per calendar month gross.

**Closing Date for Applications: 5pm on Thursday 19 March**

Applications should be made through the online form attaching a CV, before the closing date. Please note that elements of the form left incomplete will be deemed to render the application ineligible. They will be checked for eligibility and forwarded to the employer.