18/07 : Earth Observation data preparation and analysis for machine learning

Company: Deimos Space UK Ltd

Supervisor: Dr David Pettit, Head of Earth Observation

Location: Harwell Campus, Oxfordshire

Company Description:
Deimos Space UK Ltd is a wholly owned subsidiary of Elecnor Deimos, created in 2013 to address the UK and UK-export market for space systems, services and applications.
Elecnor Deimos has extensive experience in aerospace activities and has been involved in the majority of European Space Agency programmes, including Science, exploration, Earth observation, satellite navigation, launchers and human space flight.

Deimos Space UK is located on the Harwell Oxford campus, and offers expertise in the following areas:
Flight Systems
Ground Systems
Space Situational Awareness
Satellite Navigation
Applications & Services
The Deimos Space UK commercial R&D portfolio covers diverse satellite applications from smart cities to precision farming and marine operations. The company has grown rapidly and now employs around 20 people in the UK.

Our knowledge of satellites, data systems and location-based services puts the company in a unique position when developing satellite applications. Future target markets for new applications of Earth Observation data based on Deep Learning include agronomy/environment, urban mapping and coastal monitoring.

Project Description:
Satellite image analysis based on machine learning tools (neural networks and deep learning more specifically) is becoming the industry standard. Careful preparation of training data is a crucial factor in the speed and accuracy of the processing chain. The intern will contribute to the development of components and applications that extract features from satellite and aerial imagery for use in GIS applications such as agriculture, land use/land cover, urban mapping, change detection, object counting.

Increasingly, this activity requires the use of machine learning tools (neural networks and deep learning more specifically) in a cloud environment. The intern will help to prepare and analyse the data used and produced by the processing chain. For example, non-imagery data from GIS systems or from ground sensors can be used by the application for training, validation and performance analysis.

The intern will be involved in:
1) Preparing, processing data for machine learning algorithms
2) Supporting the testing of image processing chains
3) Generating reports using data analytics to analyse performance
4) Coordination with other team members who develop feature extraction tools

Deep Learning based R&D projects currently in progress include:

Car Counting to measure retail store 'footfall'
Building footprint analysis and suitability of roof tops for solar panels
Tree counting and plant counting

Applicant Specification:

Minimum Requirements:

- A university degree in a technical subject
- Work placements or practical experience related to satellite image processing

Preferred Additional Requirements:

- Masters degrees in GIS
- Knowledge of programming languages such as Python, Java

Further details:

8 weeks minimum fixed term contract to be agreed with successful candidate but nominally with a start date on or before 7 March, 2018. Salary is £375 per week for 8 week placement.

Closing Date for Applications: 8th February, 2018

Applications will be through the online form attaching a CV, before the closing date. They will be checked for eligibility and forwarded to the employer.