PhD Position: Unsupervised Learning for Hyperspectral Remote Sensing

A PhD position in the field of data science for remote sensing applications is available as a co-tutelle between the University of Rennes 1 (France) and the Norwegian University of Science and Technology (NTNU). This means that the successful candidate will be awarded a PhD degree from both Universities. The position is primarily based at the IETR laboratory (MULTIP research team) in Lannion, but the selected candidate will also spend significant time at the Colourlab in Gjøvik, Norway. The candidate will collaborate with a team of experienced researchers from the IETR and the Colourlab.

Hyperspectral imaging (HS) is a widely used technology in various environmental applications. It provides access to physical and biological properties of imaged scenes, enabling the characterisation of their health, detection and monitoring of different types of pollution, and measurement of air and water quality. HS has become more prevalent due to the development of increasingly affordable and effective sensors, as well as the utilisation of drones in remote sensing applications. However, the high dimensionality and complexity of HS data present challenges for processing and analysis. Supervised methods necessitate a substantial volume of annotated data for calibration or training, but obtaining accurate ground truth data is difficult and costly. On the other hand, unsupervised methods can identify useful information without relying on ground truth data, making them cost-effective and practical. This thesis project will focus on dimensionality reduction and semantic classification techniques to detect and monitor harmful algal blooms in Breton and Norwegian waters based on multi-scale, graph-based, and unsupervised learning methods.

The ideal candidate will have a strong background in signal processing, remote sensing, or a related field. She/he should possess proficient programming skills, along with a keen interest in statistical analysis and data science/machine learning.

Selection will be based on motivation, adequacy of profile and experience, as well as grades. Furthermore, the selected candidate must pass security clearance procedures at both universities.

The application must include:

- A cover letter where the applicant describes his/her personal motivation and relevance with respect to the requirements of the position.
- CV
- Transcripts and diplomas for bachelor’s and master’s degrees (or an official letter stating the approximate date of graduation).
- Name and contact information of three referees

For more information about the position, feel free to contact either Dr Benoit Vozel benoit.vozel@univ-rennes.fr, +33 296469071 or Dr Steven Le Moan (NTNU), steven.lemoan@ntnu.no, +47 459 14 826

Applications should be submitted via email to both benoit.vozel@univ-rennes.fr and steven.lemoan@ntnu.no with the subject “Application for PhD in Unsupervised Learning for Hyperspectral Remote Sensing” by August 27th, 2023.

Supervisors: Kacem Chehdi (IETR, Multip, UR, France) / Marius Pedersen (Colourlab, NTNU, Gjøvik, Norway)
Co-supervisors: Benoit Vozel et Claude Cariou (IETR-Multip, UR) / Steven Le Moan (Colourlab, NTNU)