

12 Months Post-Doc Position

CES THEIA "Operational Land Cover"

Mathieu Fauvel

January 22, 2016

1 Context - Project CES OSO

The objective of the project **CES OSO** is to provide land cover maps over the metropolitan France territory using satellite images time series, provided by the new satellite mission *Sentinel-2*. These maps will be provided on a regular basis. The period between two maps will depend on the application. In order to construct these maps accurately and with a reasonable time delays, automatic methods are needed together with ground-truth data, both to train the methods and to validate their outputs.

In the project CES OSO, several French laboratories (*CESBIO*, *CIRAD*, *COSTEL*, *INRA DYNAFOR*, *IGN MATIS*, *INRA ISPA*, *Météo France*, *SERTIT*) are working together to provide methods and land cover maps for different thematic applications:

- Agriculture,
- Forest,
- Disaster Management,
- ...

If several methods are now sufficiently accurate, one major remaining problem is to make these methods operational, in order to be applied with a minimized human intervention. In particular,

1. It should be robust to the dimension of the data, since hundreds of gigabytes will be processed regularly.
2. Heterogeneous field data over the territory should be included in the processing chain at a minimal cost, and conflict between the properties of different field data should be resolved.

The first point will be addressed by a post-doc hosted by the **CESBIO** lab. The second point concerns this post-doc position.

2 Objectives of the post-doc

The first mission of the post-doc position is to develop a processing chain in order to combine the different field data collected to learn/validate the different map products.

1. The recruit will identify conflicts between the different sources of information:
 - *Geometric aberrations*, e.g., overlap of two (or more) polygons with same/different classes.
 - *Geometric inconsistencies*, /e.g., a polygon that does not match its corresponding raster area.
 - *Outliers detection* for a given polygon in the corresponding raster area, e.g., bad polygon shape that includes several heterogeneous land (trees inside grassland).

- Fusing several data sources,
 - Nomenclature,
 - Resolution,
 - Temporality.
- 2. A processing chain will be developed in order to solve these issues (for a given set of selected sources of information). This processing chain will take as inputs several data sources and will output one homogeneous data source to be used in the processing chain developed at **CESBIO**.

The second mission of the recruit is to identify and contact possible ground-truth data providers: *National parks, Agriculture chambers, network on environmental issues ...* The objective is to include more ground-truth data in the validation process of the CES OSO product.

The beginning of the post-doc position is mid 2016, for one year. The location will be the DYNAFOR lab, part of the University of Toulouse and INRA, France. The grant is approximately 2100 € per month.

3 Requirements

The candidate must have a solid background in geomatics, geographic information systems and programming. An expertise in field survey as well as in image processing will be appreciated. A good knowledge of English is required.

The candidate should send a detailed CV, motivation letter and reference letter to the contacts.

4 Contacts

- Mathieu Fauvel, mathieu.fauvel@ensat.fr
- David Sheeren, david.sheeren@ensat.fr
- Jordi Inglada, jordi.inglada@cesbio.eu