Internship Proposal –

Ecological Habitat Mapping via Semantic Segmentation from airborne imagery

In the frame of a collaboration between the engineering consultancy firm ECO-MED (https://ecomed.fr/) and the Joint Research lab TETIS (https://umr-tetis.fr), we are looking for a master intern with the aim of assessing the potential of deep learning methods from the field of computer vision and AI to support ecological habitat mapping from very high resolution (airborne) imagery.

To this end, the engineering consultancy firm ECO-MED has constituted a large dataset containing both airborne imagery and manual expert annotation of ecological habitat mapping following the hierarchical nomenclature proposed in the EUNIS standard https://inpn.mnhn.fr/habitat/cd_typo/7.

This rich and extensively annotated dataset will be shared with the researchers from the Joint Research Unit TETIS, enabling them to conduct,in conjunction with the master intern, several studies to assess and quantify the capabilities of neural network-based semantic segmentation methods to detect fine-grained habitat mapping on the available very high resolution (airborne) imagery.
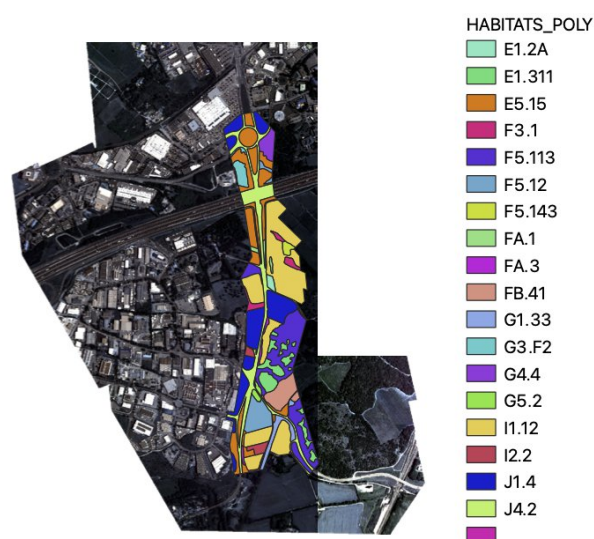
The research internship will have the following objectives:

- Conduct a literature review on Semantic Segmentation methodologies for habitat mapping from very high spatial resolution imagery;

- Explore and perform analytics on the ECO-MED dataset;

- Perform initial Semantic Segmentation tests on the data provided by ECO-MED with state of the art approaches (CNN / ViT);

- Adapt and customize state of the art Semantic Segmentation approaches to deal with the ECO-MED dataset. Possible research paths that will be explored are: i) hierarchical semantic segmentation or ii) semantic segmentation with sparse data;

- Quantitative and qualitative evaluation of the proposed method compared to state-of-the-art competitors;

- Preparation of the internship report.

Duration: around 6 months   Salary: 600€ / month

Starting date: from December 2023 (flexible)

Contacts: dino.ienco@inrae.fr; cassio@fraga-dantas.fr; diego.marcos@inria.fr; samuel.alleaume@inrae.fr