Offer #2023-06915

Internship Research

Contract type: Internship agreement

Level of qualifications required: Bachelor's degree or equivalent

Fonction: Internship Research

Level of experience: Recently graduated

About the research centre or Inria department

The Inria centre at Université Côte d'Azur includes 37 research teams and 8 support services. The centre's staff (about 500 people) is made up of scientists of different nationalities, engineers, technicians and administrative staff. The teams are mainly located on the university campuses of Sophia Antipolis and Nice as well as Montpellier, in close collaboration with research and higher education laboratories and establishments (Université Côte d'Azur, CNRS, INRAE, INSERM ...), but also with the regiona economic players.

With a presence in the fields of computational neuroscience and biology, data science and modeling, software engineering and certification, as well as collaborative robotics, the Inria Centre at Université Côte d'Azur is a major player in terms of scientific excellence through its results and collaborations at both European and international levels.

Context

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.

Assignment

This rich and extensively annotated dataset will be shared with the researchers from the Joint Research Unit TETIS, enabling the intern to conduct 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.

Main activities

The research internship will have the following activities:

- 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.

**Skills**

- Python programming
- Deep Learning with Python (preferably with Pytorch)
- Experience with Remote Sensing imagery

**Benefits package**

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

**General Information**

- **Theme/Domain**: Data and Knowledge Representation and Processing
  Biologie et santé, Sciences de la vie et de la terre (BAP C)
- **Town/city**: Montpellier
- **Inria Center**: Centre Inria d'Université Côte d'Azur
- **Starting date**: 2024-01-01
- **Duration of contract**: 6 months
- **Deadline to apply**: 2023-12-31

**Contacts**

- **Inria Team**: ZENITH
- **Recruiter**: Marcos Gonzalez Diego / diego.marcos@inria.fr

**About Inria**

Inria is the French national research institute dedicated to digital science and technology. It employs 2,600 people. Its 200 agile project teams, generally run jointly with academic partners, include more than 3,500 scientists and engineers working to meet the challenges of digital technology, often at the interface with other disciplines. The Institute also employs numerous talents in over forty different professions. 900 research support staff contribute to the preparation and development of scientific and entrepreneurial projects that have a worldwide impact.

**The keys to success**

We are looking for someone with strong competences in Python programming, experience with Deep Learning and motivated by the resolution of environmental problems.

**Warning**: you must enter your e-mail address in order to save your application to Inria. Applications must be submitted online on the Inria website. Processing of applications sent from other channels is not guaranteed.

**Instruction to apply**

**Defence Security**: This position is likely to be situated in a restricted area (ZRR), as defined in Decree No. 2011-1425 relating to the protection of national scientific and technical potential (PPST). Authorisation to enter an area is granted by the director of the unit, following a favourable Ministerial decision, as defined in the decree of 3 July 2012 relating to the PPST. An unfavourable Ministerial decision in respect of a position situated in a ZRR would result in the cancellation of the appointment.

**Recruitment Policy**: As part of its diversity policy, all Inria positions are accessible to people with disabilities.