Research Engineer

Designer of a collaborative scientific buildings dashboard

18 months, starting 1 January 2023, located at IGN-ENSG, Saint Mandé (Paris area)

We are recruiting a research engineer for 18 months, starting 1 January 2023 for the Open Research Area project 'SUBDENSE: Understanding polyrationalities of space, actors, and policies on suburban densification'.

CONTEXT:

The SUBDENSE project seeks to better understand the phenomenon of suburban densification. It is an important subject in tackling climate change by reducing net land take and suburban areas within our cities have the greatest potential for densification. Data science and spatial analysis is combined in this project with socio-anthropological approaches (Cultural Theory) and spatial planning across different institutional contexts to identify the conditions for a successful densification.

One task of SUBDENSE is to study urban densification using buildings data, i.e. at a much finer resolution than current land use land cover products, in order to consider local phenomena. This implies working with heterogeneous data; the fine specifications of buildings and parcels data products vary in time with the evolution of technologies. Data-driven analysis of the evolution of a given area over 10 years must analyse evolutions that are real change in the field and evolutions that are explained by a change of data product specifications.

The project consists of a consortium of four research partners in Germany (Technical University of Dortmund, and Leibniz Institute for Urban and Rural Ecology), France (LASTIG laboratory) and the UK (University of Liverpool). The candidate will work as part of the French team of the project, at LASTIG. There will be opportunities to engage with all partners of SUBDENSE.

LASTIG is a laboratory in Geographic Information Science studying the complete lifecycle of geospatial data, from capture to decision attached to the University Gustave Eiffel and to the French National Institute for Geographic and Forest Information (IGN). It is a pluridisciplinary team gathering research in geographical information science: sensors, 3D models, remote sensing, geocomputational algorithmy, deep learning applied to spatial data, spatial data infrastructures, knowledge graphs, geovisualisation, and geosimulation. The candidate will work within the team MEIG, for the integration and qualification of data, in collaboration with team STRUDEL, for the modelling of evolutions.

MISSIONS :

The overall mission is to participate to the design of a collaborative scientific dashboard on buildings and parcels evolution, based on 10 years of topographic data. The candidate will carry out: the development of core tools to derive evolution data over 10 years and the development of a git environnement to organise collaboration.

More specific duties are:

- Design and prototype a solution to edit and share metadata in RDF format that describe the evolution of buildings representation in the data product (e.g. change in the source for geometry, change in selection thresholds)
- Adapt the current data matching libraries of the LASTIG to the detection of buildings and parcels evolutions between two periods and qualify the results as field evolution or product evolution based on metadata produced before. The approach should be documented and transposable enough to be reproduced in different areas in France, UK and Germany by the project partners. In particular the libraries will be accessible through a QGIS plugin.
- Apply the proposed solution on spatial data in France (BDTOPO).
- Set up a git environment to share tools, protocols, metadata, building and parcels evolution data, computed on different areas, and to support comparative analysis of field evolution through space and time.
- Present findings at conferences and support in writing journal articles and other outputs as requested by the lead investigator at LASTIG.
- Actively participate as a member of the research project team and attend team meetings

SKILLS :

- Skills and evidenced experience in geographical data (vector format) management and processing
- RDF vocabularies and data
- Language: Java and python
- Good knowledge of Github functionalities and environment
- Ability to interact with partners in an international context (English)
- French is preferable to interact with the French team.
- Ability to work independently and as part of a team

The work venue is: IGN, 73 avenue de Paris, 94 160 Saint Mandé.

The salary is calculated on the basis of the candidate's experience and qualifications and of IGN's salary scale, which provides for an average salary of €2840 net per month for this type of position.

Applicants should submit a CV and covering letter, and possibly recommendations. For further particulars about the position, please contact Dr Bénédicte Bucher (benedicte.bucher@ign.fr) and Dr Ana-Maria Raimond (ana-maria.raimond@ign.fr).