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LaSTIG
Lab on Geographic Information Science for sustainable development and smart cities

Université Gustave Eiffel

Post-doctoral position: Designer of a cartographic and semantic solution for study maps production by ecologists and geomaticians

18 months from March 2024 to August 2025, LASTIG, Saint Mandé, France

Context

The ANR IntForOut project (https://anr.fr ' Projet-ANR-23-CE55-0003 , 2024-2027) aims to study the pressure exerted by outdoor leisure activities on mountain wildlife, by bringing together ecologists studying these phenomena and experts in the relevant data and associated analysis tools to support the studies.

One challenge is to make the most of the large number of sources available, to be discover and explore them and know how to use, combine and interpret them. A range of expertise is required to match the needs of ecologists for models based on observations, such as specific maps, with the possibilities offered by the available data and tools to produce these maps. One of the project's workpackages is dedicated to implementing a solution based on a knowledge graph to support this process. The principle of a knowledge graph is to explicitly model links between different domains. The domains here are the various data sources, manipulation tools and concepts of interest to ecologists. Knowledge graphs are studied in particular to link user queries to resources useful for answering these queries, in work often referred to as Question-Answering. They pose challenges in terms of graph production, particularly links between concepts from different domains, and in terms of the associated reasoning capabilities.
An essential aspect of the shared graph targeted in IntForOut is the ability of the various experts in the domains concerned to designate unambiguously what they are describing, such as an "animal hazard zone", "watercourses in the BDTopo®" or a "GPS track", upstream of the creation of links between these elements. Another aspect is the structure of the links making up the graph to enable operations such as discovering all the data enabling a danger zone or related concepts to be represented.

Missions

The aim of the position is to set up a multimodal environment for describing the data and tools available and for exploiting and enriching these descriptions in order to specify maps that are useful to ecologists by combining these data and tools, in other words to engage the different experts in the coproduction and co-usage of the knowlegde graph.

The multimodality lies in the use of a cartographic interface combined with a semantic interface for querying graph data. This environment should be aimed at experts from the various project profiles, enabling them to work together to specify the study maps to be prototyped as part of the project. This environment should be set up iteratively, involving the target users in a prototype.

Job environment

The post-doc will work in the LASTIG laboratory. The LASTIG is a research laboratory of the Université Gustave Eiffel and the IGN with around 44 permanent staff and 25 PhD students/post-doctoral fellows. The research carried out at LASTIG covers the entire lifecycle of geographic information, from acquisition to visualisation, including qualification, classification, enrichment, integration and simulation. The MEIG team, in which the thesis will take place, carries out research into spatio-temporal data management, natural language processing, collection and integration of crowd-sourced data (participatory science), knowledge modelling and automatic enrichment.

He or she will be working with the IntForOut project partners: the University of Tours computer science laboratory (LIFAT), the Alpine ecology laboratory (LECA) of the University of Grenoble Alpes and the University of Savoie Mont-Blanc, and the Mont Blanc high altitude ecosystem research centre (CREA).

The place of work will be LASTIG, 73 avenue de Paris, 94 160 St Mandé, accessible by metro from Paris, and possibly the site of Champs sur Marne, accessible by RER A, Noisy Champs.

Remuneration is based on a salary scale that takes experience into account, ranging from €30k to €35k or more.

Skills required

A thesis in geomatics
Geographic data modelling,
Ability to work in a multi-disciplinary context, open-mindedness,
Interface development will be carried out in Python
Knowledge of graph formats (RDF) is a plus but not necessary

How to apply

Send your application (letter + CV) with "IntForOut-WP1-Postdoc" in the subject line by February 29th to :
Bénédicte Bucher, e-mail: benedicte.bucher@ign.fr

Interviews will take place early March and the post will be filled in March.