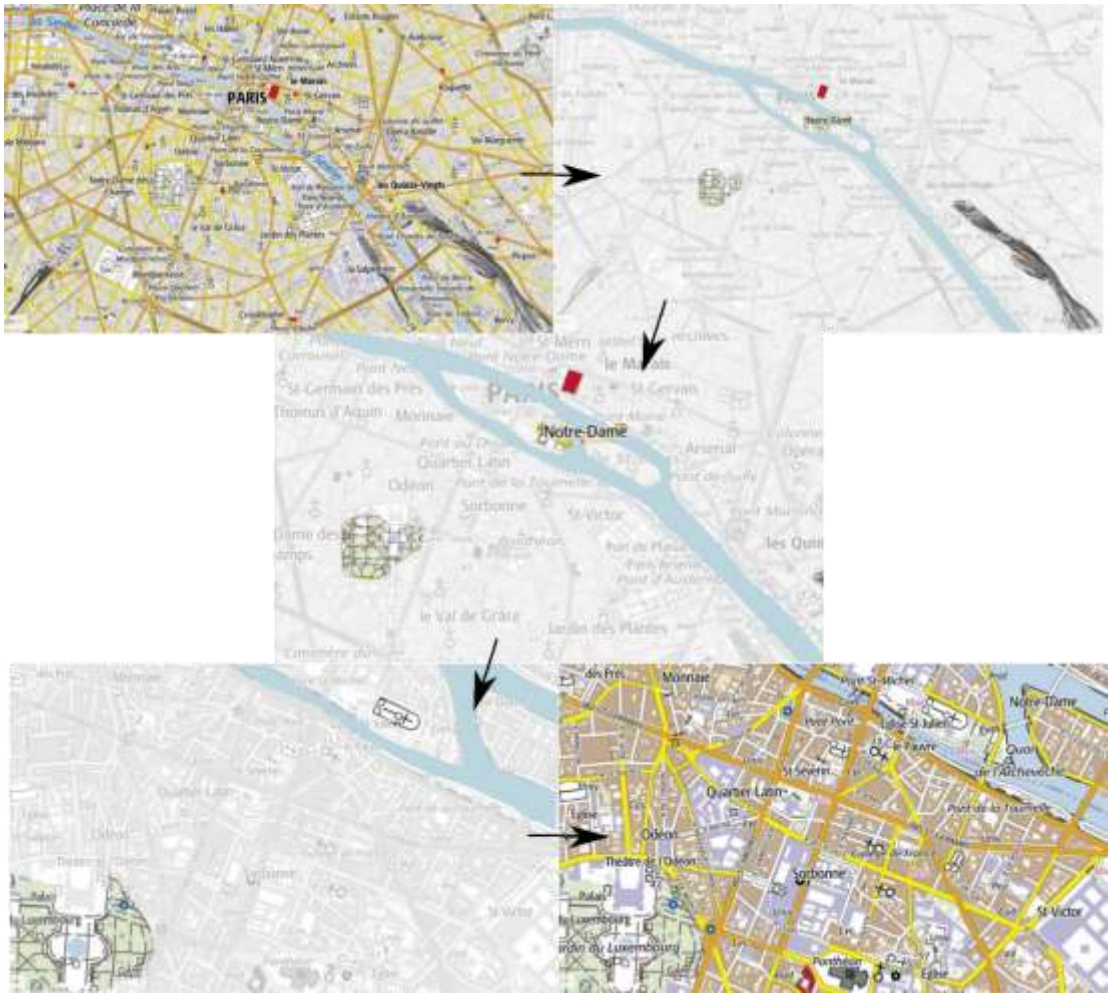
IT engineer/geographical information scientist position in the LostInZoom research project

Context

LostInZoom is starting a research project funded by a Europe Research Council Consolidator grant. It is usual for all of us, in our daily use of multi-scale maps, to feel lost for a few seconds because the map has changed after we zoom in or out. To make smoother zooming interactions, the aim of the project is to change the way we zoom in on maps by using landmarks salient at different scales to anchor the multi-scale representations (see figure below).

This idea is based on the anchor-point theory of spatial cognition (Couclelis, 1987), which states that a person's mental representation of space is composed of fragments at different scales that are tied by landmarks called anchor-points. The project is based on an interdisciplinary approach between geovisualisation, spatial cognition, and human computer interaction.



Multi-scale visualisation is a long-time research topic at the LASTIG lab. In particular, LASTIG researchers have investigated the automation of map generalisation, i.e. the process to generate small scale legible maps from more detailed maps at larger scales. LostInZoom will build upon LASTIG's past research to design this novel way of zooming on maps.

Main tasks

The LostInZoom project will use an experimental approach to explore the potential of anchor-based zooming, and the main task of the engineer will be to build the data and software architecture enabling the experiments carried out by the researchers of the project.

The first task will be to enable the storage and the use of large datasets mixing OpenStreetMap and IGN data. These datasets will be used in various web multi-scale maps, and classical open source web mapping technologies such as Geoserver and OpenLayers will be used.

Then, as these web maps will be used in controlled user surveys, libraries will be developed to enable records of the user activity with the map (e.g. quantity of zooming interactions, tracking of the mouse in the map). This part also includes the use of eye-tracking devices during the experiments.

The project will also involve map generalisation tasks to generate smooth and progressive scales, where anchors are smoothly transformed, and these tasks will be based on the open source CartAGen platform, developed by LASTIG researchers. The engineer will be in charge of developments on this platform, in particular to make more easily usable by researchers outside the lab.

Finally, a part of the LostInZoom project focuses on deep learning techniques to recognise multi-scale patterns that can be used as anchors. The engineer will be in charge of the brand new open Python platform DeepMapGen that gathers the research prototypes using deep learning on maps, in particular for map generalisation. The engineer will also help setting up deep learning benchmarks related on the project research.

Candidate profile

We are looking for candidate with a Master or engineering school degree in geographical information science, with a taste for cartography and geovisualisation, and IT development skills.

Wage conditions

This is a **full-time 3 year position**, with a salary depending on the experience of the candidate. The salary will follow the salary grid of engineers in the French administration.

Work place

The postdoc will take place at the LASTIG lab, in the GEOVIS team, in the buildings of IGN, the French National Mapping Agency (73 avenue de Paris 94160 Saint-Mandé France). Foreign travels to visit collaborators of the LostInZoom project will be possible.

Contact

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To apply, please send to G. Touya the following documents before April 30th, 2021 : CV, cover letter, and some references.