Where are the anchors in a multi-scale map?

Postdoc position in Geographic Information Science

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.

Main tasks

One of the main goals of the project is to able to recognise the potential anchors in a multi-scale map, in order to later enhance the map by making them more visible at multiple scales. This general goal can be addressed by several research directions: user surveys, coupled with eye-tracking can help us understanding what exactly people look at when they try to know where they are during and after a zoom; deep learning based pattern recognition is being used more and more with maps, and we could train such models to recognise these anchors considering the maps at several scales at the same time; multi-scale anchors are often salient in the map and the saliency models in computer vision can also be used as a proxy to "anchorness". Recent research also explored the use of artificial landmarks to enhance object location memory (Korte et al., 2022), and one direction we would like to explore is the use of such artificial anchors across scales. Considering their background, the candidate will explore one, or several, of these possible research directions.

Then, the postdoc candidate will have the opportunity to develop projects with the other members of the LostInZoom project (post-docs, PhD students, GI scientists), other than the core topic of the post-doc.

Finally, the postdoc candidate will have a role in the daily animation and communication of the project, along with the Principal Investigator and the other project members. It involves the co-organisation of weekly meetings, updating the project website, co-organisation of workshops. Teaching duties are also possible at ENSG if the candidate wishes.

Candidate profile

We are looking for a candidate with a PhD in geographical information science, or in cognitive sciences, with a taste for cartography and geovisualisation.

Wage conditions

The postdoc is a **full-time 1 year position**, with a salary depending on the experience of the candidate.

Work place

The postdoc will take place at the LASTIG lab, in the buildings of ENSG, the French school of GI science (6-8 Avenue Blaise Pascal, Champs-sur-Marne, France). Visits to Orléans (BRGM) and Montpellier will be frequent.

Contact

Guillaume Touya, senior researcher, PI of LostInZoom, LASTIG, IGN, ENSG, Univ Gustave Eiffel. guillaume.touya@ign.fr
To apply, please send to G. Touya the following documents: CV, cover letter, and some references.

Bibliography

Couclelis, H., R. G. Golledge, N. Gale, and W. Tobler. 'Exploring the Anchor-Point Hypothesis of Spatial Cognition'. Journal of Environmental Psychology 7, no. 2 (June 1987): 99–122. https://doi.org/10.1016/s0272-4944(87)80020-8.

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Korte, Annika, Julian Keil, Frank Dickmann. « The Impact of Map-Structuring Elements on Object Location Memory Error ». Abstracts of the ICA 5 (2022): 1-2. https://doi.org/10.5194/ica-abs-5-109-2022.

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