

Job offer – Computer scientist

Within the framework of several research projects, a planning concept, Fractalopolis, has been developed at Théma based on a multi-scale logic referring to fractal geometry. It allows defining both a general framing of the development areas at the scale of a metropolitan area, and a fine modeling up to the scale of housing blocks. The scenario analyzes and specifies the distribution of housing and households in the zones, with a nesting logic of scale with variable degrees of concentration (density) that can be parameterized according to the position of the development zones. The concept allows evaluating for a given scenario the accessibility to different types of amenities. This evaluation takes into account their importance for the residents according to their daily, weekly, monthly and rare needs.

To set up scenarios for a given real situation, a software was developed in Java (<https://sourcesup.renater.fr/fractalopolis/>). It allows developing scenarios in an interactive way by means of a cartographic representation of the study areas and visualizes on it different information (number of dwellings, evaluation of the accessibilities...). The existing software is a research tool and does not lend itself as a decision support tool in planning departments.

Within the framework of the proposed employment, a software will have to be developed which allows to conceive scenarios according to the Fractalopolis logic, but which allows a simple passage with existing GIS in particular QGIS. This version will have a simplified parameterization compared to the research version. However, other types of information in relation to important characteristics and functionalities in land use planning will have to be integrated, as well as certain standard indicators. This software will be developed in Python and will have to work as a plug-in in the QGIS software.

In a second step, a software will be developed that will only be used for the 3D visualization of a scenario without modifying it by using existing simulators. This software is intended for a wider audience, that of decision-makers or the population concerned.

The person recruited will work in the Théma Research Institute in direct contact with the researchers and the computer scientist who developed the Fractalopolis software.

Desired skills and knowledge:

- **Skills:** Python programming, QT interface, HMI ergonomics
- **Knowledge :** Geographic information system (QGIS, ArcGIS, ...)

Level of studies : Masters degree in computer science

Type of contract: 1 year fixed-term contract

Remuneration: according to diploma and experience / indicate salary range

Workplace: UMR Théma, University of Franche-Comté and CNRS, Besançon

Starting date: as soon as possible

Contact:

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