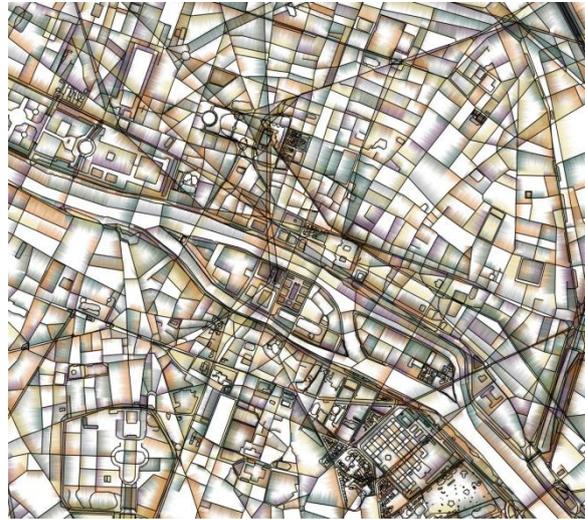# Interactive Illustrative Map Visualization

Non-photorealistic rendering and, more recently, illustrative visualization are established sub-areas of computer graphics for some time now and are inspired by traditional artistic and illustrative depictions. This project will look into extending an existing illustrative rendering of geographic map data that takes data from OpenStreetMap and derives map graphs that are then abstracted and, thus, simplified. This process uses a force-directed approach, orthogonalization, progressive meshes, and other simplification techniques. Inspired by the existing Substrate simulation, colored patches are then added by adding "bristles" perpendicular to each original map edge. These bristles contain a constant and a random part and fade out toward the end, creating the effect of water-color patches (see the top-right image and the webpage http://tobias.isenberg.cc/VideosAndDemos/Isenberg2013VAS).

The first goal of this project is to create a web-based implementation of the approach which is currently implemented in Java and Processing. Then, the goal is to investigate ways to extend the approach such that, in addition to linear segments, the algorithms can also recognize primitives other than straight lines (for example, circle arcs) and process them as such. In addition, closed loop elements (lakes, islands, land regions) will be detected and turned all into one direction (so that the illustration is consistent). Another aspect will be the implementation of panning and zooming interaction which automatically queries new data and changes the visualization accordingly. By adding controls that allow showing only higher-level streets, new forms of abstraction are integrated. This also includes investigating including the ability to download data at large scales such as country boundaries and land/continent lines or to visualize point data elements (points of interest). The project will also add an effective undo function to the interface that allows users to return to previous stages of the exploration. Finally, the web-based implementation should be such that people can post intermediate results in a gallery such that others can comment on them and also use posted maps as starting points for their own exploration.

Contact: Dr. Tobias Isenberg <tobias.isenberg@inria.fr>
                  (http://tobias.isenberg.cc/)

Group: AVIZ team, INRIA Saclay
                  (http://www.aviz.fr/)

Lab: AVIZ-INRIA, Université Paris Sud
                  Bâtiment 660 (Digiteo-Moulon)
                  91405 Orsay Cedex