CO-061

QUALITY ANALYSIS OF OSM DATA BASED ON APPLICATION NEEDS

MONDZECH J., SESTER M.
Leibniz Universität Hannover, HANNOVER, GERMANY

Community based initiatives for data collection are abundant. One of the most prominent initiatives is the OpenStreetMap project, where volunteers acquire spatial information and upload it for public use. This leads to huge and rich spatial data sets, containing all kinds of information about the environment. Due to its voluntary basis, there is no central organization which controls the data acquisition. This leads to an uneven distribution of the data, which is more dense in urban areas and less in rural regions; also it differs according to the relative enthusiasm of the people in a country.

In order to describe the usability of a data set, information about its quality is essential. There are many investigations related to the quality of OSM, which are mainly based on absolute measures (e.g. length of road network) or geometric comparisons with existing data sets. In this paper, we present a novel approach which links the notion of quality with the suitability for a certain usage. As OSM contains a lot of navigation related information, we use the example of navigation.

In our case, the quality measure of a data set is its suitability for pedestrian navigation. The quality is determined based on simulated routes on two networks which are compared. For our comparison, we use OSM data and the German topographic data set ATKIS. In addition to shortness of the route also accessibility is used as quality criterion. The approach is tested with three different test areas in Germany, namely urban, suburban und rural scenarios.

In the paper, first related work is presented, followed by a detailed description of the approach and a presentation and discussion of the results. It turned out that the quality of the determined routes (i.e. the length) links well with the quality of the underlying data: in a dense network, all locations within the areas can well access the roads and also find a short path along the route to the destination. In less dense or inhomogeneous networks the opposite is true, which leads to longer routes.

Figure 1 shows an example of a route calculated between two points on the two networks. Obviously in this case, routing on the OSM data set is shorter than routing on the ATKIS one.

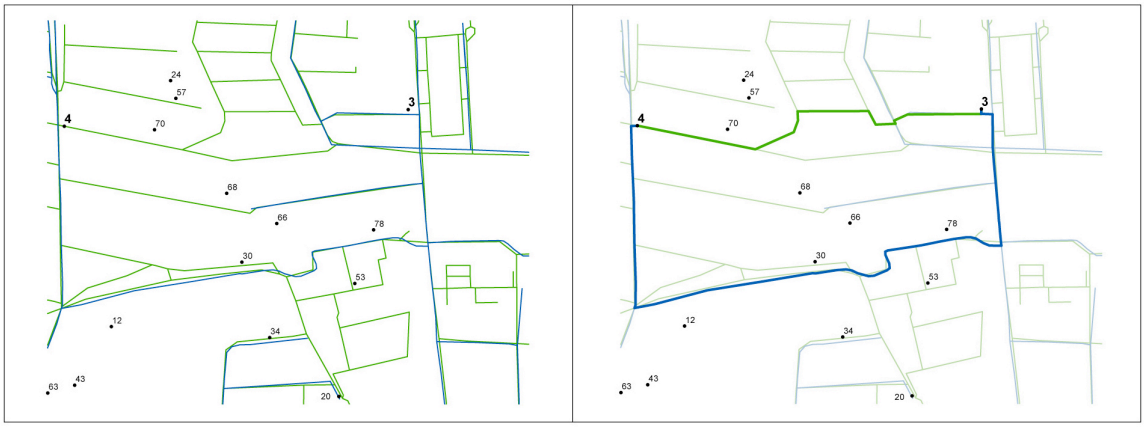

Figure 1: Routing graphs with random locations (left); shortest routes between points 3 and 4 in both data set (right): blue route is longer (green: OSM, blue: ATKIS).