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The Semantic Map Method: Visualizing Spatial Perception

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Abstract:

Innovative cartographic approaches can help us understand how people perceive surrounding space. This poster presents the **Semantic map** method, which is based on the tradition of mental mapping of geographic space. It effectively connects qualitative data from subjective perception with quantitative spatial analysis and visualization. Primary data are usually collected through semi-structured interviews accompanied by a mental map. From these, specific spatial meanings are then extracted into a GIS (Geographic Information System) environment. The poster focuses on the process of data processing itself and the subsequent creation of cartographic outputs. The basic element of visualization is the font size of individual meanings, which dynamically reflects their frequency of mention by respondents. These meanings are further clustered into broader semantic areas based on their similarity, which can be represented by a color hue.

As one of the partial outputs, the concept of **semantic routes** was also developed, in which the line width represents the frequency of passages (ribbon method) through the given area, and to which local meanings are attached. This method is similar to a flow map method. Another analytical step is classifying meanings, which are shown in the above-mentioned semantic map, as positive or negative. Their spatial density is then visualized using **hot spot maps** (also called heat maps), possibly with **3D visualization** to provide a more realistic representation.

All three methods are analyzed in terms of the graphic variables used (Bertin, 1967), the method of localization, and their advantages and disadvantages. The presented methods show how a subjective experience of a place can be transformed into precise spatial data, creating a shared image of the territory, making semantic maps a valuable tool for urban planners, city decision-makers, and tourism planners.

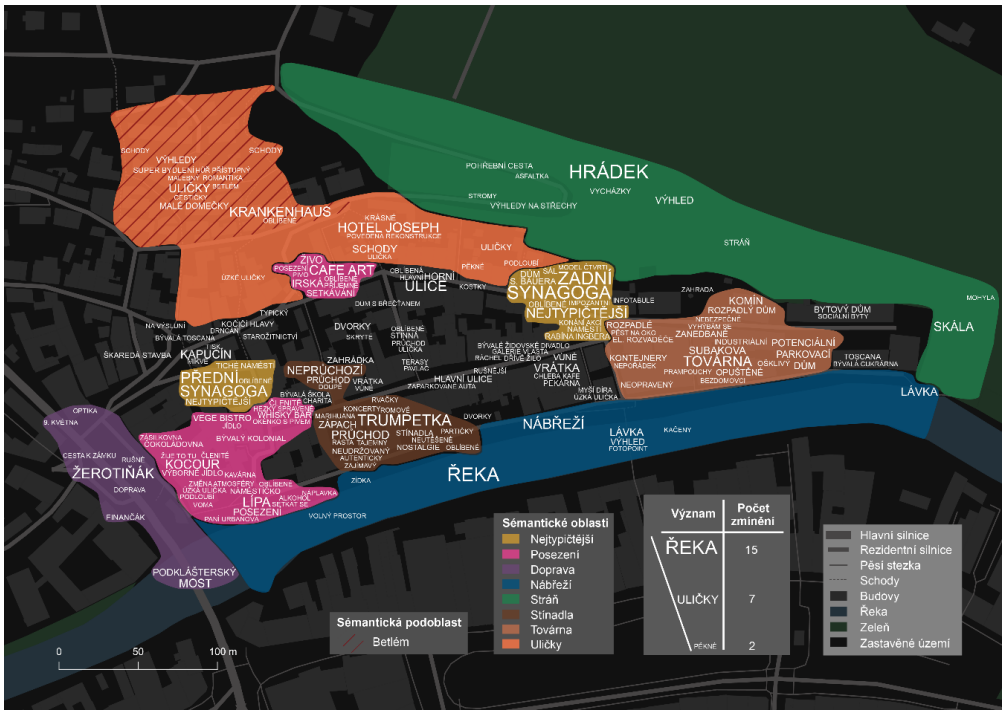

Figure 1. Semantic map with semantic areas [in Czech], EPSG: 32633

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Figure 2. Semantic route [in Czech], EPSG: 32633

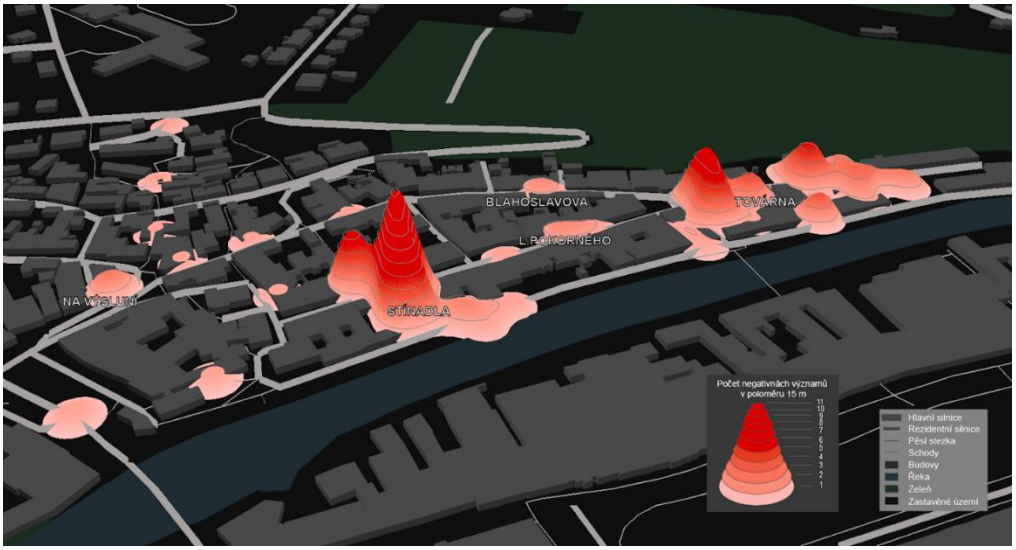

Figure 3. Density of negative meanings [in Czech], EPSG: 32633

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References

Bertin, J., 1967. Semiology of Graphics. Gauthier-Villars, Paris, 431 pp.