

Abstract

Cities are complex systems, and the task of accounting for this complexity in improving city quality is immense. International initiatives, such as the Sustainable Development Goals or the New Urban Agenda, often focus on this improvement of the urban quality in order to address urban challenges. The concept of livability, interpreted as the quality of the person-environment relationship, can support these endeavors by depicting the complex urban system and its components through the lens of this person-environment relationship.

Despite the challenges of urban life, cities are for and about people by providing various benefits. Therefore, personal aspects or interests cannot and should not be neglected – neither in urban planning nor in livability assessment. However, the inclusion of highly subjective and constantly changing personal needs and preferences into the analysis leads to a common challenge of livability assessment platforms. Namely, these assessment approaches should not only be able to represent the expectations and preferences of the dwellers towards the urban environment but at the same time also to consider spatial (and temporal) aspects of the measured factors to represent the dynamic nature of the urban systems.

The current doctoral research investigates how urban livability assessment combined with geospatial analysis methodologies offer a way to reduce this complexity of the urban systems and livability itself by handling the characteristics and phenomena of cities systematically. Beyond the traditional role of GIS in collecting, storing, and visualizing data and results of the spatial and temporal analysis, I detail further potentials of applying a GIScience approach in livability assessment.

The first objective of this doctoral research is to provide a conceptual framework for defining and assessing livability. Therefore as a first step, I briefly introduce the challenges of defining and assessing livability, along with the key elements of the concept. As a follow-up, in favor of the second objective, I describe the developed approaches to grasp the complexity of the person-environment relationship in order to handle the mentioned challenges of livability assessment. All the examples are constructed in a way to represent either a specific segment (e.g., temporal sensitivity, urban parks) or the overall assessment of livability by focusing on the person-environment relationship, and the perception of people, instead of merely statistical factors such as income levels or number of facilities.

As introduced and discussed in the different publications of this thesis; questionnaires, assessment platforms, spatiotemporal and sentiment analysis of social media data, or biosensors quantifying human perception are all promising ways to assess the elements of the person-environment relationship and thereby livability. This is mainly due to the fact that these approaches facilitate the extraction of relevant information from raw data in a systematic and intersubjective way. By considering the spatial and temporal characteristics of the data using GIS and having a firm concept with complementary intersubjective analysis techniques – researchers, decision-makers, urban planners and other stakeholders can gain valuable insights on urban livability, also by identifying less well-performing areas and elements of a city.

Keywords: livability, GIS, assessment platform, person-environment relationship, social media data, urban form, urban functions