

The virtual city

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Abstract

Cities are superimpositions of many different networks, and today a significant portion of these networks operates in the digital realm. Cultural, economic, administrative, and infrastructural urban structures have increasingly become digitized or are fundamentally generated through digital means. These structures are part of the city and interact with its physical elements. Unlike the physically experienceable city, however, these digital components remain invisible and can only be perceived through digital applications and interfaces. While individual aspects of these systems have already become subjects of urban research in recent years, there are still relatively few concepts addressing the effects of the city as a holistic digital entity.

One possible approach to describing the extension of cities into digital space is the comprehensive consideration of urban data traces. This theoretical construct – the virtual city – can be described and further examined through spatial theory and insights from urban studies. Building on this framework, perceptual-psychological phenomena, as well as transformations in urban planning and urban public space, can be investigated with regard to their correlation with the concept.

A future design challenge in this context will be to develop forms of translation for aspects of the virtual city that help make them understandable and tangible. Such approaches could foster a new understanding of cities as integrated physical and virtual realities. To gain access to these combined systems, interactive visualizations and physicalizations of urban data traces are proposed. They can serve as a starting point for further exploration at the intersection of the physical and virtual city.

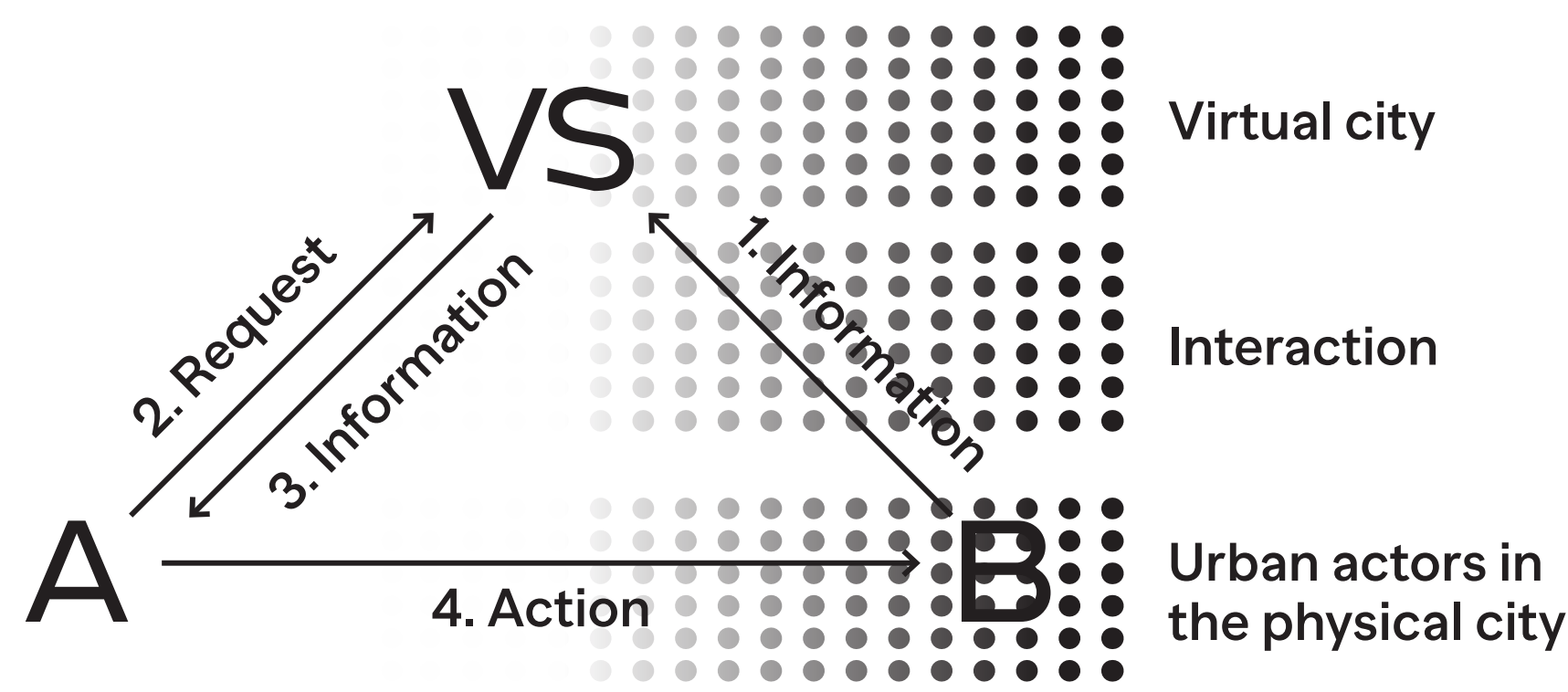
„[...] the urban public sphere can no longer be considered as a purely physical construct.“

de Waal 2014:20

Master thesis – a theoretical approach to the holistic representation and interpretation of urban data traces.



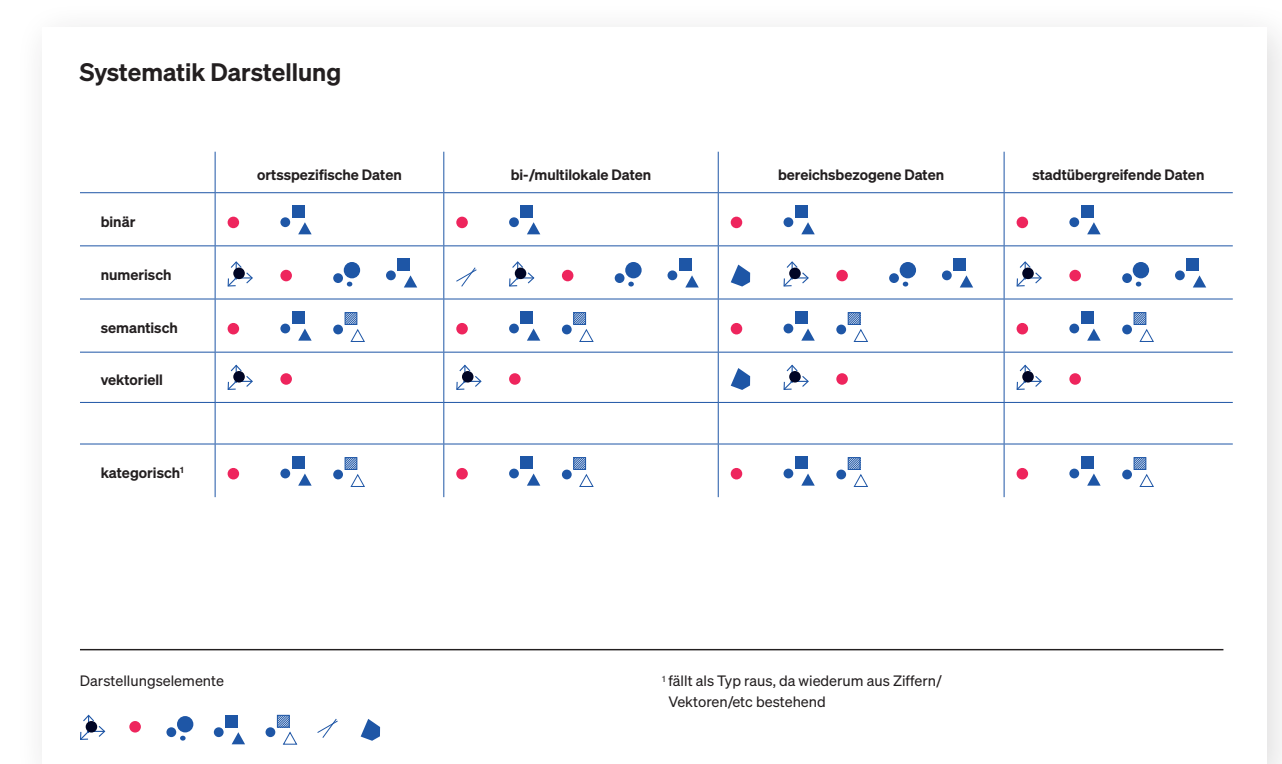
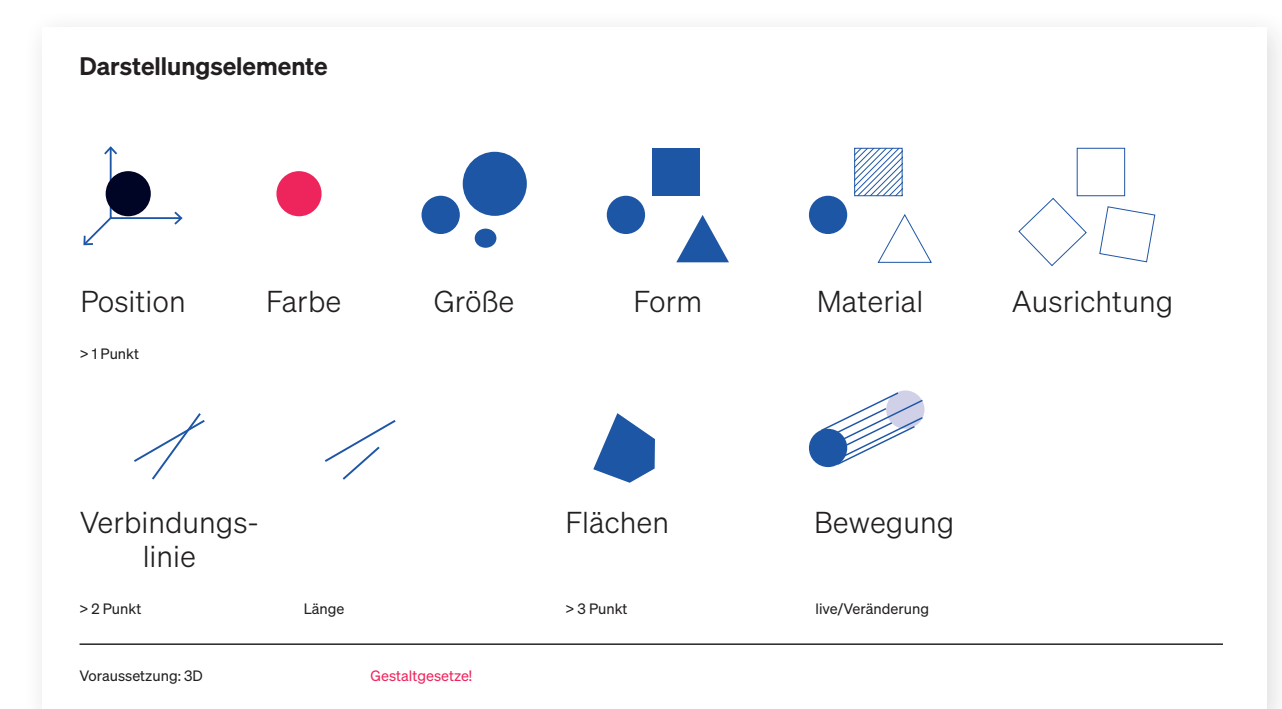
Methodology



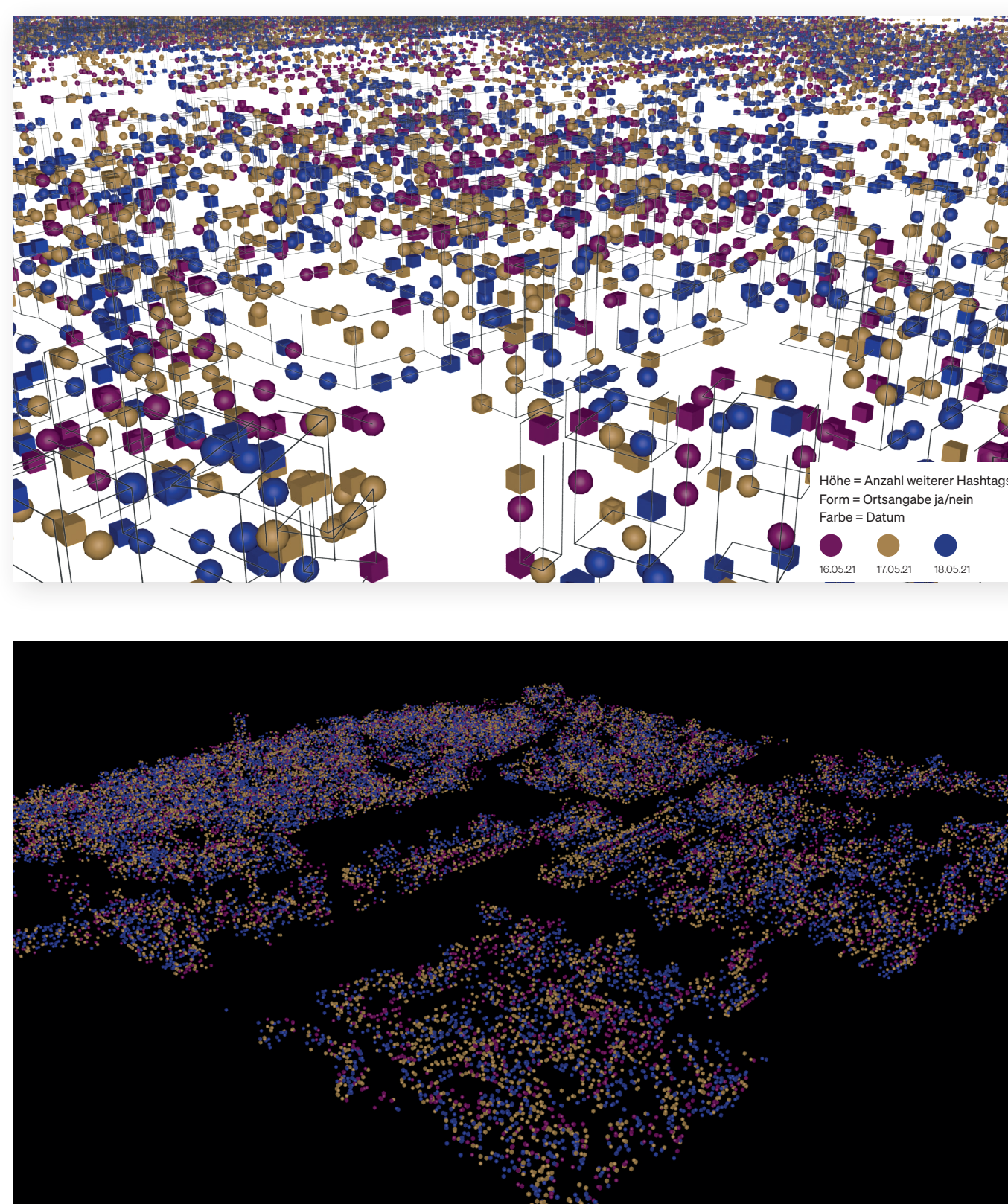
Axiomatic approach



If the possible data fields are categorized according to their types and properties and combined with basic graphical elements, a translation system emerges. The individual units were matched based on shared characteristics and according to the principle of exclusion: vector data fields contain three values and therefore must be represented graphically using three values as well, for example through position (in three-dimensional space) or color (RGB). Binary data fields should be translated using two clearly distinguishable variants, such as different shapes. It also became apparent that datasets can be classified according to their thematic relationship to a city—in this case, Regensburg.



Solution approaches



The virtual city is the virtual reflection of social relationships in correlation with a collection of digital information about (all kinds of) actors and other components of the urban physical space. It is a digital place that city residents can access and within which they can act, respond to one another, and communicate with each other. Unlike the built city, the virtual city is not a closed system with clearly defined boundaries; it has open ends and exists as a conglomerate of locally stored digital datasets and city-related data traces distributed online.

Conclusion

Through the systematic and exploratory translation of the elements of urban datasets and their overlapping relationships, a virtual representation of any city can be rendered visible. The focus lies on the semantic interpretation of urban data points and their further development into sonified, visualized, or physicalized knowledge.

Embedded within the broader context of urban studies, the present work can at most be understood as an initial approach or a first theoretical description of a virtual construct that extends our physical cities. There can be no single representation of the virtual city, since all the data traces discussed here exist in binary code and are therefore inherently formless. Beyond the examples outlined in this work, there are infinitely many possible ways—or virtualities—in which these data traces could be made perceptible visually, audibly, tactility, or through other sensory modalities.

However, it may be the role of designers and artists to give these data traces a form, at least in exemplary and partial ways, enabling city residents to regain access to “their” data.

More information



interactive data installation
„ausschlaggebend“



webapp research tool
„the individual city“

