

Integrating 3D Data in Service-based Visualization Systems

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ABSTRACT

Georeferenced data is available from a wide range of sources, e.g., Directory Services, Sensor Observation Services, Web Feature Services or even proprietary interfaces. Many of the data originating from an Internet of Things will be three-dimensional representing outdoor as well as indoor geographic features and their properties. Based on this data, its integration, and its visualization totally new applications and systems could be designed and implemented supporting various applications domains. Recent work in the area of service-based 3D visualization enables high-quality visualization of complex 3D geodata, e.g., 3D city models and 3D indoor building models, on thin clients as well as mobile devices such as smartphones and tablets. This work uses a service-based, image-based visualization approach that decouples the server-side resource-intensive management and rendering of complex, massive 3D geodata from client-side display functionalities: A Web View Service provides image representations of a 3D scene; these images, which can contain different types of information per pixel, are transmitted to a client application that can reconstruct a 3D representation of this scene. – In this talk, we will describe how to combine 3D geodata originating from the Internet of Things with this service-based approach in a way that allows for the interactive exploration of and interaction with 3D worlds and objects of interest. In detail, this 3D geodata can be integrated into the visualization process a) at the rendering stage of a portrayal service, b) through an image post processing step or c) in the client application itself. Moreover, this data can be visually represented directly by modifying the appearance of existing features, e.g., for visualizing measurements, or indirectly by introducing additional objects, e.g., icons, into the 3D scene. We will discuss advantages and disadvantages of these different approaches for implementing visualization applications using live geodata sources.