

# **Tangible mixed reality on-site**

## **Interactive augmented visualisations from architectural working models in urban design**

Gerhard Schubert, David Schattel, Marcus Tönnis, Gudrun Klinker and Frank Petzold

Technische Universität München  
{schubert, petzold} @tum.de  
david\_schattel@gmx.de, {toennis, klinker} @in.tum.de

**Abstract.** The consequences of architectural planning and design decisions made in the early design phases are hard to foresee. While professionals are used to reading plans and understanding architectural models, most laypeople are not familiar with their abstractions. This can lead to misinterpretations and misunderstandings between the different participants in the design process, especially in complex building situations, and decisions can be made or rejected that can have far-reaching consequences for the remainder of the project.

In this paper we describe the concept and prototypical implementation of a decision-support system for the early design and discussion stages of urban design projects that aims to address precisely this problem. The setup directly connects physical volumetric models and hand-drawn sketches with an interactive, mixed-reality visualization presented on a tablet or mobile phone, making it possible to see an interactive real-time view of an architectural design within the context of the actual site. In addition, the system is able to incorporate interactive simulations conducted on the model and presented in the AR-view.

**Keywords:** early design stages, urban design, HCI, tangible interfaces, immersive environment, simulations