

AMUSE: Acquiring and Modeling Urban Simulation Environments

Daniel G. Aliaga

The visualization of large urban environments is a great challenge for computer graphics. Cities are a complex collection of man-made structures arranged in parcels, city blocks, and neighborhoods. A digital model of such a large scale urban environment enables multiple visualization applications for urban planning, emergency management, and reconnaissance and rapid prototyping. Our approach is to perform an inverse urban modeling task by inferring the 2D procedural structure of an existing urban environment. From aerial views and their associated metadata, we build a representative 2D grammar that models the distribution of roads, parcels, and buildings in the urban space. In this preliminary talk about this ongoing project, we describe how to parse an urban layout, simplify both the terminals and the production rules of the grammar, and derive new urban spaces. The result is a compact grammar allowing us to create plausible modifications to the existing urban environment, in the style of the original. We attempt to demonstrate urban grammars extracted from several real-world scenarios and illustrate how the grammar can be used for urban planning, emergency management and rapid prototyping.