

An Image Based Grammar for the Modification of Cities

Nate Andrysko

We present a new approach for visualizing large urban environments. Our image based approach uses 2D satellite images to create an “Urban Grammar”. The grammar describes a city’s layout and is used to create new novel cities in the style of the original city. It will also be shown how our method can be used in city planning or rapid prototyping. The user can stretch and shrink the city, as well as move the city’s inner boundaries. In real-time the user can see a resulting city that is similar to the original. Issues involved in the editing include grammar simplification, region similarity estimation, and n-gon to m-gon mapping. Grammar simplification greatly helps reduce the number of computations needed during derivation. Similarity estimation is an essential tool needed in derivations and most phases of editing. N-gon mapping is used to project texture coordinates from a region in the original city to a new, possibly deformed, region in the edited city.