Carlos Vanegas
Content-Aware Urban Layout Editing

Abstract:

We present an interactive system for efficient and intuitive urban layout creation and modification. Our key inspiration comes from recent content-aware image editing methods. These techniques use high-level image information to enable fast and intuitive operations such as "smart" resizing and image retargeting beyond that provided by naïve image processing. In a similar fashion, we use the information provided by aerial photographs and GIS or by procedural methods to generate an urban layout and provide the tools and algorithms for the efficient and interactive creation of new urban spaces and the modification and extension of existing urban areas. The end result is the intuitive, rapid, and interactive generation of new or edited urban layouts which include visual imagery as well as a valid and feasible underlying structure including a hierarchy of streets and intersections, and parcel information. We demonstrate our system by editing and extending several existing cities, ranging from hundreds to thousands of city blocks and parcels and by quickly generating new cities in the style of other cities.