

Interactive rendering of urban models with global illumination

Argudo, Oscar; Andujar, Carlos; Patow, Gustavo A.



We propose a photon mapping-based technique for the efficient rendering of urban landscapes. Unlike traditional photon mapping approaches, we accumulate the photon energy into a collection of 2D photon buffers encoding the incoming radiance for a superset of the surfaces contributing to the current image. We define an implicit parameterization to map surface points onto photon buffer locations. This is achieved through a cylindrical projection for the building blocks plus an orthogonal projection for the terrain. An adaptive scheme is used to adapt the resolution of the photon buffers to the viewing conditions. Our customized photon

mapping algorithm combines multiple acceleration strategies to provide efficient rendering during walkthroughs and flythroughs with minimal temporal artifacts. To the best of our knowledge, the algorithm we present in this paper is the first one to address the problem of interactive global illumination for large urban landscapes.