

Global Occlusion Map: A New Occlusion Culling Approach

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Abstract

Occlusion culling is an important technique to speed up the rendering process for walkthroughs in a complex environment. In this talk, we present a new approach for occlusion culling regarding a view cell. A compact representation, Global Occlusion Map (GOM), is proposed to store the global visibility information of general 3D models with respect to the view cell. GOM provides a collection of Directional Visibility Barriers (DVB), which are virtual occluding planes aligned with the main axis of the world coordinates that act as occluders to reject invisible objects lying behind in every direction from a view cell. Since GOM is a two-dimensional array, its size is bounded, depending only on the number of the sampled viewing directions.

Furthermore, it is easy to conservatively compress GOM by accounting it as a depth image. Due to the special orientations of DVBs, both the computational and storage cost for occlusion culling based on GOM is minimized. Our implementation shows Global Occlusion Map is effective and efficient in the urban walkthrough application.