



EXTRACTION OF 3D NAVIGATION SPACE IN VIRTUAL URBAN ENVIRONMENTS (ThuAmOR6)

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★ Abstract :

Urban scenes are one class of complex geometrical environments in computer graphics. In order to develop navigation systems for urban sceneries, extraction and cellulization of navigation space is one of the most commonly used technique providing a suitable structure for visibility computations. Surprisingly, there is not much work done for the extraction of the navigable area automatically. Urban models, except for the ones where the building footprints are used to generate the model, generally lack navigation space information. Because of this, it is hard to extract and discretize the navigable area for complex urban scenery. In this paper, we propose an algorithm for the extraction of navigation space for urban scenes in three-dimensions (3D). Our navigation space extraction algorithm works for scenes, where the buildings are in high complexity. The building models may have pillars or holes where seeing through them is also possible. Besides, for the urban data acquired from different sources which may contain errors, our approach provides a simple and efficient way of discretizing both navigable space and the model itself. The extracted space can instantly be used for visibility calculations such as occlusion culling in 3D space.

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(cont.)

Furthermore, terrain height field information can be extracted from the resultant structure, hence providing a way to implement urban navigation systems including terrains.