

A Fast Silhouette Detection Algorithm for Shadow Volumes in Augmented Reality

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Abstract : Real-time shadow generation in virtual environments and Augmented Reality (AR) was always a hot topic in the last three decades. Lots of calculation for shadow generation among AR needs a fast algorithm to overcome this issue and to be capable of implementing in any real-time rendering. In this paper, a silhouette detection algorithm is presented to generate shadows for AR systems. Δ + algorithm is presented based on extending edges of occluders to recognize which edges are silhouettes in the case of real-time rendering. An accurate comparison between the proposed algorithm and current algorithms in silhouette detection is done to show the reduction calculation by presented algorithm. The algorithm is tested in both virtual environments and AR systems. We think that this algorithm has the potential to be a fundamental algorithm for shadow generation in all complex environments.

Keywords : silhouette detection, shadow volumes, real-time shadows, rendering, augmented reality

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