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An iterative programmable graphics process unit based on ray casting approach for virtual endoscopy system

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Keywords

virtual endoscopy, linear interpolation, medical image processing, graphics process unit (GPU), ray casting, isosurface

Abstract

In this paper, a fast graphics process unit (GPU) based ray casting algorithm is presented to improve image quality. A linear interpolation is used to estimate the intersection between a ray and isosurfaces. Thus, resampling artefacts is greatly reduced and the performance is not influenced. An iterative estimation is presented to further improve image quality. According to the distance the ray goes across, z values in the z-buffer are modified to implement hiding of hybrid scenes. Experimental results show that the algorithm can produce high quality images at interactive frame rates and implement hiding of hybrid scenes very well.

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