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Kinect深度图像快速修复算法

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Fast Inpainting Algorithm for Kinect Depth Map

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摘要 深度提取是基于"纹理+深度"自由立体视频系统的关键技术，而立体视频实际应用系统需要高效快速的深度图提取.提出一种针对Kinect提取深度图的快速修复算法.首先，对Kinect提取的彩色纹理图和深度图进行对齐裁剪，并采用背景填充算法对裁剪后的深度图进行初步修复；然后，对初步修复后的深度图进行基于颜色匹配的快速修复，得到质量较好的可用深度图.实验结果表明，本算法能有效修复原始深度图中由于遮挡而引起的空洞，获取的深度图整体平滑度好、边缘清晰；在普通PC机上达到25~30 帧/s的处理帧率，实现了深度图的实时提取.

关键词： 深度图修复   实时获取   颜色匹配   Kinect   立体视频

Abstract： Depth extraction is a key step in 3D video system based on texture plus depth. Real application systems require high efficiency and fast depth extraction. This paper presents a fast inpainting algorithm for Kinect depth map. This paper clips and aligns the origin color and depth images captured by Kinect, and partially fill holes in the clipped depth image using a background based method. Then this paper uses a fast inpainting algorithm based on color match to fill the remaining holes in the depth image to obtain a better depth image. Experimental results show that the proposed algorithm can efficiently repair errors in the original depth map such as holes caused by occlusion. Finally we obtain a smooth depth map with clear edges. The processing speed can reach 25~30 frame/s by using an ordinary desktop computer to realize real-time depth map extraction.

Keywords： depth map inpainting,   real-time capture,   color match,   Kinect,   stereo video

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