

应用

实时3DV系统中面向虚拟视绘制的快速深度编码

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摘要:

在基于深度的三维视频系统中, 合成视的质量与深度图的质量息息相关。为加快深度数据的压缩速度并保证重建虚拟视点图像的质量, 提出了一种面向虚拟视点绘制的快速深度编码算法。根据深度数据的特点及深度失真对绘制视质量的影响, 将深度图像划分为边缘区域与平坦区域, 并相应地为深度编码中的宏块模式选择设计了两种搜索策略。对边缘区域及纹理复杂区域采用全搜索策略, 对平坦区域及低纹理区域采用SKIP模式、帧间16×16模式和帧内模式搜索。实验结果表明, 与X264编码方案相比, 本文方法在保证虚拟绘制图像质量与编码码率不变的前提下, 显著提高了编码速率, 可应用于实时的基于深度的三维视频系统中。

关键词: 视点合成; 深度编码; 边缘检测; 模式选择

Fast Depth Coding for Virtual View Synthesis in Real Time 3DV System

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Abstract:

The synthesized result in depth based three-dimensional video system highly depends on the quality of the depth map. A fast depth map compression method oriented to virtual view rendering is proposed in order to speed up the compression of depth data while ensure the image quality of the synthesized virtual view. According to the characteristics of depth data and the impacts of depth distortion on virtual view synthesis, depth map is divided into edge regions and smooth regions, and correspondingly two search strategies are designed for the mode decision in depth map coding. Full search is for relatively complexity regions and edge regions, while SKIP, Inter 16×16 and all macroblock modes of Intra are for smooth regions and low complex regions. The experimental results evaluated by objective and subjective methods indicate that compared to X264, the proposed algorithm not only accelerates the depth map encoding greatly but also maintains considerable virtual view rendering quality with constant bit rate. It can be applied in real time depth based three-dimensional video system.

Keywords: view synthesis; depth coding; edge detection; mode decision

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