

一种稳健的多视频时空超分辨率重建算法

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A Robust Space-time Super-resolution Reconstruction Algorithm Based on Multiple Video Sequences

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摘要

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摘要 为了提高视频序列的时间分辨率和空间分辨率, 该文提出了一种基于一阶范数和时空总变分正则化方法的时空超分辨率视频重建算法。该算法利用同一场景的多个具有子像素空间位移偏差和子帧率时间偏差的低分辨率视频序列, 重建得到一个高时空分辨率视频序列。在求解过程中不需要直接构造大型矩阵, 大大降低了对内存的要求。实验结果表明该算法是有效的, 且对成像模型估计误差具有一定的鲁棒性。

关键词: 超分辨率视频重建 时间分辨率 空间分辨率 正则化

Abstract: To improve the temporal-spatial resolution of video, a space-time super-resolution reconstruction algorithm using L1 norm minimization is proposed, and space-time regularization based on the total variation is utilized. The proposed algorithm can increase the resolution both in time and in space by using multiple low resolution video sequences of the same scene obtained at sub-pixel and sub-frame misalignments. This algorithm does not require large matrixes directly constructed, which reduces greatly the memory requirements. Experimental results show the effectiveness of the algorithm and verify the robustness of the algorithm to errors in imaging model estimation.

Keywords: Super-resolution video reconstruction Temporal resolution Spatial resolution Regularization

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