

一种基于三维自组织映射的立体图像编码方法

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摘要: 立体图像的数据量成倍增加, 在图像信息的传输、存储方面遇到很大挑战. 自组织映射(SOM)是一种非常有效的聚类算法, 在图像处理、数据可视化等领域得到了广泛的研究与应用. 为了提高左图像编码效率提出了一种基于三维频域敏感自组织映射(3DFSSOM)的立体图像编码算法. 该算法对左图像进行基于3DFSSOM的矢量量化编码; 对矢量量化(VQ)和视差估计(DE)的残差均进行JPEG编码; 对视差矢量进行霍夫曼编码. 此外, 在3DFSSOM算法中引入不等式判据, 来降低失真测度的计算复杂度. 通过实验表明: 左图像的编码效率得到了很大改善, 计算复杂度明显降低.

关键词: 立体图像; 自组织映射; 矢量量化; 视差估计

中图分类号: TP183

文献标识码: A

文章编号: 1000-7180(2015)11-0011-04

A Stereo Image Coding Method Based on Three-Dimensional Self-Organizing Map

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Abstract: The data volume of stereo image increases exponentially, so the transmission and storage of image information encounter a great challenge. The self-organizing map is a very efficient clustering algorithm, it is widely researched and applied in image processing, data visualization and other fields. In order to improve the coding efficiency of the left image, this paper presents a stereo image coding algorithm based on the 3D frequency sensitive self-organizing map. Left image is encoded by the vector quantization based on 3DFSSOM in this algorithm. These residuals are encoded by the JPEG, which are obtained by the vector quantization and the disparity estimation. Disparity vector is encoded by the Huffman code. In addition, the proposed algorithm reduces the computational complexity of distortion measure by introducing inequality criterion in 3DFSSOM algorithm. The experiments show that coding efficiency of the left image is improved greatly, the computational complexity of algorithm is also reduced significantly.

Key words: stereo image; self-organizing map; vector quantization; disparity estimation

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收稿日期: 2014-12-27; 修回日期: 2015-02-16

基金项目: 国家自然科学基金地区科学基金项目(61261035)