计算机工程与应用 2010 46 (6): 148-150 ISSN: 1002-8331 CN: 11-2127/TP

图形、图像、模式识别

自适应投票快速中值滤波算法研究

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收稿日期 2009-2-17 修回日期 2009-4-8 网络版发布日期 2010-2-23 接受日期

摘要 中值滤波是图像处理中常用的滤波方法，其优点是能有效滤除图像中的噪声像素，同时还有一定的保持图像边缘的效果；其缺点是滤波速度慢、图像边缘细节保持效果不理想。在分析中值滤波及其改进算法的基础上，提出了自适应投票快速中值滤波算法（AVMF）。该算法一方面利用图像噪声的特征自适应筛选出需要滤除的噪声像素，另一方面利用滤波窗口的中值元素的特点以及滤波窗口移动的特性，采用完全不排序的投票法快速计算中值。使用Lena图像对AVMF算法进行测试实验，实验结果表明：AVMF同多种中值滤波改进算法比较，不仅能有效滤除噪声和较好地保留图像边缘细节，而且极大地提高了滤波处理速度。

关键词 图像处理 中值滤波 自适应投票法

分类号 TP301 TM621

Research on auto-adapted voting fast median filtering algorithm

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Abstract

The median filtering is a common method used in image processing.Its advantages lie in that it can not only eliminate the noise pixels effectively，but also maintain the image edge to some extent.But the filtering speed and the effect of maintaining the image edge detail are not ideal.On the basis of analyzing the median filtering and its improved algorithms，Auto-adapted Voting fast Median Filtering（AVMF） is proposed in this paper.On one hand，this algorithm screens the noise pixels auto-adaptively using the characteristics of image noise；on the other hand，using the characteristics of median pixel and the window moving，adopting voting algorithm without sorting in whole，the median value is obtained quickly.The Lena image is used to carry on the test experiment for the AVMF algorithm，and the results show that compared with many other improved median filtering algorithms，using AVMF to image filtering，the noise is reduced effectively，the image edge and the detail are maintained well，moreover，the filtering is speedup greatly.

Key words image processing median filtering auto-adapted voting

DOI: 10.3778/j.issn.1002-8331.2010.06.042

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