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一种基于积分图像的快速归一化积相关算法(PDF)

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Title: A Fast Normalized Cross Correlation Algorithm Based on Integral Image

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关键词: 归一化积相关; 积分图像; 图像匹配

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摘要: 归一化积相关算法鲁棒性强、精度高, 是图像相关匹配的首选算法。但是原有归一化积相关算法的过程都比较复杂, 运算速度较慢, 因而在一定程度上限制了它的应用。鉴于此, 文中提出了一种基于积分图像的快速归一化积相关算法, 将一定区域的像素求和运算转化成四个顶点像素值的简单加减, 降低了计算复杂度, 并且大大提高了归一化积相关算法的执行速度。经实验证明, 文中算法不仅能够保证图像的匹配精度, 而且其整体运行时间仅为原算法的1/8。

Abstract: The normalized cross correlation which has high robust and precision is the prior algorithm in image correlation matching, but the computing process of this algorithm is so complicated as to limit its application. Therefore, a fast normalized cross correlation algorithm was proposed. When computing the sum of pixels' value in a certain region, the four vertices pixels' value of the region just need adding and subtracting with the algorithm. The computation complexity is reduced and the implement speed of the original normalized cross correlation algorithm is greatly improved. The experimental results show the fast algorithm has the same matching precision with the original one, and its computing time is just 1/8 of the original one's.

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备注/Memo: 收稿日期:2008-12-22 作者简介:韩冰 (1982-), 女, 山东兖州人, 博士研究生, 研究方向 :数字图像处理、目标自动识别与跟踪。
