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基于改进形状上下文特征的二值图像检索

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Binary image retrieval based on improved shape context algorithm

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摘要 提出了改进的形状上下文算法以克服传统的形状上下文算法不具备旋转不变性这一缺点.该算法利用找寻包含采样点数最多的角度区间的方式改变图像角度,对相对应的区域进行比较,并计算匹配代价,从而为形状上下文加入旋转不变性.为提高运算速度,算法也引入了剪枝方法,解决了进行直方图距离计算时遍历采样点的问题.实验显示,本文的算法在公开数据库上测试得到的精确度召回率(PR)曲线与郑提出算法的PR曲线性能接近,但是计算速度较其提升了近1倍;与传统的形状上下文算法相比,提出算法的PR曲线更为优越,且检索精度有较大提高.因此,提出的算法综合检索性能更好,能够有效地的应用于二值图像检索领域.

关键词 : 二值图像, 图像检索, 形状上下文, 旋转不变性, 剪枝

Abstract : An improved shape context algorithm is proposed to overcome the shortcoming of traditional shape context algorithm in lacking of rotation invariance ability. The algorithm looks for the direction where the most sampling points are included to change the image angle. Then it compares the corresponding regions in the image and calculates the match cost to add the rotation invariance ability into the algorithm. To improve the calculation speed, the pruning is induced in the algorithm to address the problem of traversing sample points in calculating the histogram distance. The experiment in the case of the same recall rate shows that the Precision Racall Line(PR) curve of proposed algorithm is closed to that of the Zheng', but the calculating speed is double that of above mentioned. Moreover, the PR curve of this algorithm is obviously better than that of traditional shape context algorithm, and the retrieval speed is increased greatly. Therefore, the overall performance of the algorithm is improved, and it is more suitable for the binary image retrieval.

Key words : binary image image retrieval shape context rotation invariance pruning

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