Mean-Shift跟踪算法中核函数窗宽的自动选取

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Abstract
Classic Mean-Shift based tracking algorithm uses fixed kernel-bandwidth, which limits the performance when the object scale exceeds the size of the tracking window. Based on the analysis of similarity of object kernel-histogram in different scales, i.e. the Bhattacharyya coefficient, a theorem is found and proved i.e. the changes of object scale and position within the kernel will not impact localization accuracy of Mean-Shift based tracking algorithm. Using this theorem an automatic bandwidth selection method is proposed based on backward tracking and object centroid registration. The proposed method is applied to track vehicle changing in size with encouraging results.

摘要
传统核窗宽固定的Mean-Shift跟踪算法不能很好地对逐渐增大尺寸的目标进行有效的跟踪.在分析同一目标在不同尺度下核直方图基于Bhattacharyya系数相似性的基础上,发现并证明了在核窗宽固定的条件下,目标在其窗宽范围内进行缩放、平移运动并不影响Mean-Shift跟踪算法空间定位的准确性.在此基础上,提出了一种基于后向跟踪、形心配准的核窗宽自动选取算法.对尺度渐大的车辆进行的跟踪实验验证了该算法的有效性.

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