

论文

基于直方图处理和新型相似性度量函数的小尺寸目标跟踪算法

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摘要:

小尺寸目标跟踪是视觉跟踪中的难题。本文使用均值移动算法跟踪小尺寸目标。论文首先分析了基于均值移动的小尺寸目标跟踪算法的两个主要问题: 跟踪算法中断和跟踪目标丢失。然后, 论文在这两个方面对小尺寸目标跟踪算法进行改进。给出了一种新的直方图单元编号方法, 使包含目标颜色分量的直方图单元分布得更为集中紧凑。当候选目标与目标模型不匹配时, 给出一种平滑算法来处理候选目标的直方图。论文提出一种新的相似性度量函数, 推导了相应的权值计算公式, 在此基础上建立了基于均值移动的目标跟踪算法。多段真实场景视频序列的跟踪实验表明, 本文提出的算法可以有效地跟踪小尺寸目标, 跟踪精度也有一定提高。

关键词: 小尺寸目标跟踪 均值移动 直方图处理 相似性度量 权值计算

Small Target Tracking Based on Histogram Processing and a New Similarity Measure

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Abstract:

Small scale target tracking is one of the primary difficulties in visual tracking. In this paper, we extended the framework of mean shift based small target tracking. First, we analyzed two major problems in small target tracking, namely tracking interrupt and target losing. Then the tracking algorithm was modified to address these problems. The main contributions of this paper contain: the histogram bins were reindexed to represent the target bins compactly; the target candidate histogram was smoothed if it is mismatch with the target model; a new similarity measure was proposed to improve the tracking accuracy and robustness, and the corresponding weight computation was derived. Several tracking experiments for real world video sequences show that the proposed algorithm can track the target effectively and accurately.

Keywords: Small target tracking Mean shift Histogram processing Similarity measure Weight computing

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