

### 基于直方图插值的均值移动小尺寸目标跟踪算法

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### Small Target Tracking Based on Histogram Interpolation Mean Shift

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摘要

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**摘要** 小尺寸目标跟踪是视觉跟踪中的难题。该文首先指出了均值移动小尺寸目标跟踪算法中的两个主要问题：算法跟踪中断和丢失跟踪目标。然后，论文给出了相应的解决方法。对传统Parzen窗密度估计法加以改进，并用于对候选目标区域的直方图进行插值处理，较好地解决了算法跟踪中断问题。论文采用Kullback-Leibler距离作为目标模型和候选目标之间的新型相似性度量函数，并推导了其相应的权值和新位置计算公式，提高了算法的跟踪精度。多段视频序列的跟踪实验表明，该文提出的算法可以有效地跟踪小尺寸目标，能够成功跟踪只有 $6 \times 12$ 个像素的小目标，跟踪精度也有一定提高。

**关键词：** 小尺寸目标跟踪 均值移动 直方图插值 Parzen窗 相似性度量

**Abstract:** Small scale target tracking is one of the primary difficulties in visual tracking. Two major problems in mean shift small target tracking algorithm are presented in this paper, namely tracking interrupt and target losing. To tackle these problems, the Parzen windows density estimation method is modified to interpolate the histogram of the target candidate. The Kullback-Leibler distance is employed as a new similarity measure function of the target model and the target candidate. And its corresponding weight computation and new location expressions are derived. On the basis of these works, a new mean shift algorithm is proposed for small target tracking. Several tracking experiments for real world video sequences show that the proposed algorithm can track the target successively and accurately. It can successfully track very small targets with only  $6 \times 12$  pixels.

**Keywords:** Small target tracking Mean shift Histogram interpolation Parzen window Similarity measure

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