

论文与报告

## 一种改进的Mean Shift跟踪算法

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摘要

本文主要针对经典的Mean Shift跟踪算法均匀剖分整个颜色空间造成许多空的直方图区间以及不能准确表达目标颜色分布的缺点,提出了一种改进算法.该改进算法首先对目标的颜色进行聚类分析,根据聚类结果通过矩阵分解和正交变换自适应地剖分目标的颜色空间从而确定对应于每一聚类的子空间.在此基础上定义了一种新的颜色模型,该模型统计落入每一颜色子空间的像素的加权个数并用高斯分布建模每一个子空间的颜色分布,并推导了一种相似性度量来比较目标和候选目标的颜色模型之间的相似程度.最后基于该颜色模型提出了改进算法.实验表明,基于该颜色模型的改进算法比经典的Mean Shift算法具有更好的性能,而跟踪时间与经典算法大致相同.

关键词 [目标跟踪](#) [Mean Shift](#) [颜色模型](#) [相似性度量](#)

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## An Improved Mean Shift Algorithm for Object Tracking

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Abstract

The traditional Mean Shift tracking algorithm partitions uniformly the whole color space, leading to a great number of void histogram bins, and is unable to represent accurately the color distribution of the object. To address the problems, we present an improved algorithm. Firstly the object color is analyzed using a clustering algorithm, and according to the clustering result the color space of the object is partitioned into subspaces by matrix factorization and orthonormal transformation. Then a new color model is defined by considering the weighted number of pixels as well as within-cluster distribution with Gaussian, and a novel measure is derived to evaluate the similarity between the reference color model and the candidate model. Finally an improved algorithm is proposed based on the color model. Experiments show that the improved algorithm has better performance than and is computationally comparable to the conventional mean shift algorithm.

Key words [Object tracking](#) [Mean Shift](#) [color model](#) [similarity measure](#)

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