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论文

一种新的基于Mean Shift的目标三自由度跟踪算法

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摘要
标准Mean Shift跟踪算法仅能确定目标形心位置，而不能确定其旋转角，在跟踪细长形目标时鲁棒性不好。为此，该文提出了一种三自由度Mean Shift跟踪算法，新算法在计算目标特征分布直方图时，用像素的位置转角及其到目标形心的归一化距离加权，并将像素在局部坐标系下的特征转角作为新特征引入。这种新的目标表示模型能够方便地纳入Mean Shift优化框架，通过迭代求解，可同时精确确定目标的形心位置和方位指向。实验结果表明该算法精度高，计算量小。

关键词 目标跟踪 均值漂移 转角定位

分类号 TP391

A New Mean Shift Based Algorithm for Tracking Targets with Three Degrees of Freedom

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Abstract
Standard Mean Shift tracker can only successfully locate the object center, but fail to find its orientation, which make it not robust to track thin object. To remedy this, an improved mean shift tracker is proposed in this paper. The new tracker use new object representation, where pixels are weighted with both their position-angles and normalized distances from target center, furthermore, pixel's feature-angle, which can be seen as new feature, is introduced in. The new object representation can be conveniently integrated into the optimization framework of mean shift. By iterative optimization, both the location and orientation of targets can be precisely determined. Experimental results show the algorithm can get precise tracking results with low computational cost.

Key words Object tracking Mean shift Orientation localization

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