

应用

HOG特征混合模型结合隐SVM的感兴趣目标检测定位算法

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摘要:

针对传统基于梯度方向直方图特征检测算法对解决目标模型单一、发生形变、存在遮挡及目标受干扰下定位困难的问题, 提出一种基于HOG特征混合模型结合隐SVM的感兴趣目标检测算法。首先利用训练图像的HOG特征金字塔表示得到包含感兴趣目标根模型、部件模型和对应可变形部件特征表示, 该模型不仅描述目标的整体轮廓, 而且能够捕捉到更为精细的目标部件轮廓, 在一定程度上提高了检测算法在目标姿态复杂情况下的鲁棒性。然后利用HOG特征混合特征训练部件检测分类器LSVM(Latent Support Vector Machine)。最后通过动态规划和距离转换算法在测试图上扫描出与可变形部件模型相匹配的区域, 实现感兴趣目标的检测定位。经过多组实验结果表明, 所提出的算法能较好地解决目标在发生较大形变和存在遮挡等复杂姿态下的定位问题。

关键词: 目标检测; 混合模型; 梯度方向直方图; 动态规划; 隐支持向量机

Object Localization Algorithm Based on Mixture Model of HOG Feature and LSVM

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Abstract:

Because the traditional object localization algorithm based on histogram of oriented gradient (HOG) feature is difficult to detect the object when the target poses are complex. A localization algorithm of Object-of-Interest (OOI) based on mixture model of HOG feature and LSVM to solve this problem is presented. Firstly, the features of HOG for mixture models of OOI that include root models, part models and corresponding deformation models are computed. And then, the classifiers LSVM for mixture models of OOI that include root models, part models and corresponding deformation models are trained effectively by HOG feature pyramid of train images. Last, the OOI is localized according to dynamic programming and generalized distance transforms under which the matching region with the deformation models in test images. The models capture not only general outline of the targets, but also more specific target parts outline, so it is robust when target poses are complex. The experimental results show that this method can solve the problem of localization when the target poses are complex such as partly changed and occluded.

Keywords: Object detection Mixture model Histogram of oriented gradient (HOG) Dynamic programming Latent support vector machine

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