

论文

基于形状统计模型的多类目标自动识别方法

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摘要

形状是人类视觉系统分析和识别目标的基础。针对现有方法的不足, 该文提出了一种新的基于形状统计模型的多类目标自动识别方法。该模型定义形状基元对作为特征描述子, 从样本图像中抽取典型基元对, 聚类量化后组成形状字典。然后综合分析各类信息, 通过无监督学习来统计目标的特征分布状况, 构建类别形状模型。快速定位目标区域并辨识对象类别后, 可结合图像分割获取精确形状。实验结果表明, 该方法能准确、高效地提取多种类型和复杂结构的目标, 较好解决了噪声干扰、旋转侧偏等问题, 具有较强的实用价值。

关键词 [图像处理](#) [目标识别](#) [形状统计模型](#) [无监督学习](#)

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Automatic Multi-categorical Objects Recognition Using Shape Statistical Models

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Abstract

Contour features are powerful cues for human vision system to analyze and identify objects. A new method for automatic multi-categorical objects recognition using shape statistical models is proposed to improve the disadvantages existing in most of the relative methods. This method defines firstly the shape base pairs as feature descriptors, and extracts typical shape base pairs from sample images to build a feature codebook. Then, unsupervised learning is performed to calculate the feature distribution and design class-specific shape models. After detecting the regions and determining the categories quickly, segmentation could be applied to obtain the precise outlines. Experimental results demonstrate that proposed method can achieve high efficiency and accuracy in extracting manifold and complicated objects, and resolve the problems of noise disturbance, rotations at a certain extent.

Key words [Image processing](#) [Object recognition](#) [Shape statistical models](#) [Unsupervised learning](#)

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