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基于分等级对象语义图模型的复杂目标自动识别方法研究

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Hierarchical Objects Semantic Graph Based Hybrid Learning Method for Automatic Complicated Objects Recognition

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摘要 目标自动识别是图像处理领域的研究热点。针对现有方法的不足，该文提出一种新的基于分等级对象语义图模型的复杂目标自动识别方法。该方法通过构建分等级对象语义图模型增强对目标与背景间、目标部件间语义约束的利用，引入置信对象网络统计局部特性，利用消息机制传递对象间相互影响，实现概率语义分析。训练中还将产生式和判别式方法结合，提高了目标识别的准确度。在自然和遥感部分目标类别数据集上的测试结果表明，该方法能完成对多种类型和复杂结构目标的识别和提取，具有一定的实用价值。

关键词： 图像处理 目标识别 分等级语义 混合学习 置信消息

Abstract： Automatic objects recognition is a key issue in image processing area. A new hierarchical objects semantic graph based hybrid learning method is proposed to recognize targets in complicated images. This method builds a hierarchical semantic graph model to reinforce the semantic constraints among targets, background, and components in images. And it also proposes a belief objects network to improve the utilization of spatial information, by using local classifier to calculate objects properties and using belief messages to propagate the objects relationships. Besides, the method uses discriminative learning and generative learning interleavely to improve the training error, memory usage and recognition efficiency. Experimental results demonstrate that the proposed method is meaningful and helpful for image understanding.

Keywords： Image processing   Object recognition   Hierarchical semantic   Hybrid learning   Belief message

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