

基于多任务联合稀疏表示的高光谱图像分类算法

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摘要: 为了充分提取高光谱图像丰富的光谱信息, 尽可能降低光谱冗余, 同时保留较多有效判别信息. 基于高光谱图像单波段的谱间相似性, 提出了基于多任务学习和稀疏表示的分类算法. 该方法将光谱间的冗余特性转化为有效信息加以利用, 使用波段交叉分组策略构建子任务, 并引入稀疏表示模型将所有分类任务进行联合表示, 最终根据所有任务的累积残差确定测试样本的类别. 实验对比分析了多任务联合表示分类和单任务分类的准确率. 结果表明, 基于多任务联合稀疏表示模型的分类性能优于单任务模型.

关键词: 多任务学习; 稀疏表示; 高光谱图像; 图像分类

Joint sparse representation and multitask learning for

hyperspectral Image classification

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Abstract: Hyperspectral images have abundant spectral information, and thus the adjacent single-band images usually contain similar and redundant information. To simultaneously reducing spectral redundancy and retaining more effective discriminant information, a novel classification algorithm based on multitask learning and sparse representation is proposed in this paper. In this method, the spectral redundancy is transformed into effective information and a band cross-grouping strategy is used to construct sub-tasks. Sparse representation model is introduced to jointly represent all classification tasks. Finally, the test samples are classified according to the cumulative residual of all tasks. An experiment is performed between multitask learning and the single task learning. The experimental results show that the classification performance of the former is better than the later.

Key words: multitask learning; sparse representation; hyperspectral images; image classification

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