

技术方法

基于ASTER数据的决策树自动构建及分类研究

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摘要:

在对ASTER原始9个波段数据进行各种变换处理的基础上,采用数量化指标平均可分性方法确定参与分类的最佳特征组合;结合研究区8种主要地物类型训练数据集,分别采用最大似然法、BP神经网络法和基于See 5.0数据挖掘的决策树分类法进行分类,提取主要地物的空间分布专题信息。经过379个野外样点的验证,结果表明:决策树算法分类性能最优,神经网络算法次之,最大似然法效果最差;与ENVI 4.1、ERDAS 8.7提供的传统决策树建立及分类方法比较,基于数据挖掘工具See 5.0和Cart的决策树生成和分类方法具有客观、高效率、分类性能可靠和精度高等优点。

关键词: ASTER 杨树 回归树 See 5.0 分类

A STUDY OF AUTOMATED CONSTRUCTION AND CLASSIFICATION OF DECISION TREE CLASSIFIERS BASED ON ASTER REMOTELY SENSED DATASETS

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Abstract:

Based on performing various sorts of image processing on the original 9 bands of ASTER sensors, the authors objectively adopted the quantitative indicator of average separability to determine the optimal combinations of features most suitable for classification. In conjunction with the signature or prototype data for each class, the maximum likelihood classifier, BP neural network classifier and decision tree classifier based on data mining software of See 5.0 were respectively implemented to characterize the spatial distribution patterns of major land cover types over the entire study area. The final classification results based on field validation with 379 actual observations show that the decision tree algorithm possesses the best performance of extraction, with an overall accuracy of 84.4% and a kappa coefficient of 0.822, followed by the BP network algorithm, and that the maximum likelihood classifier has the worst performance of classification. In comparison with the traditional establishment and classification procedures which have been embedded into ENVI 4.1 and ERDAS 8.7, the automated decision tree algorithm used in this study is based on See 5.0 and Cart module (Classification and Regression tree). Due to its objectivity, high efficiency, reliability and high accuracy, the automated decision tree deserves more attention in future practice of classification.

Keywords: ASTER Poplar Decision tree See 5.0 Classification

收稿日期 2005-11-14 修回日期 2005-12-09 网络版发布日期

DOI:

基金项目:

国家林业局“3S技术在森林资源调查中的应用”课题资助项目(20003270080);江苏省高校自然科学基金研究计划项目资助(05KJD220096);南京林业大学科技创新项目资助(CX05-010-4)。

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