Comparing and optimizing land use classification in a Himalayan area using parametric and non parametric approaches

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(Received 27 October 2006; in final form 30 January 2007)

Abstract: Supervised classification is one of important tasks in remote sensing image interpretation, in which the image pixels are classified to various predefined land use/land cover classes based on the spectral reflectance values in different bands. In reality some classes may have very close spectral reflectance values that overlap in the feature space. This produces spectral confusion among the classes and results in inaccurate classified images. To remove such spectral confusion one requires extra spectral and spatial knowledge. This paper presents a decision tree classifier approach to extract knowledge from spatial data in the form of classification rules. The extracted knowledge was used for improving the classification accuracy. The results of this study also indicate that the knowledge extracted from this approach can solve the problem of spectral confusion to some extent. The results were compared with the maximum likelihood classification. It was found that the overall accuracy of the classification improved by approximately 10 percent. In this study, the effects of the cardinality i.e. variations in training data set size on the accuracy of the decision tree classifier was also studied. Results indicate that the classification accuracy increases with training data set size but up to a certain limit.

Keywords: Knowledge Base Classification, Decision Tree Classifier, Maximum Likelihood Classifier (MLC)