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POST-CLASSIFICATION APPROACH BASED ON GEOSTATISTICS TO REMOTE SENSING IMAGES : SPECTRAL AND SPATIAL INFORMATION FUSION

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Abstract. Classification of remote sensing imagery provides an inexpensive yet efficient approach to land cover mapping. In supervised image classification, training samples are collected through certain sampling schemes, which are used to derive classification rules, aiming for adequate accuracy for the applications at hand. However, in conventional classification methods, the potential of training samples in terms of locational information is not tapped further, confounding the classification accuracy to the limited separability inherent to the given input feature vector. This paper explores two methods pertaining to geostatistics, i.e., simple kriging with local mean and cokriging, to predict class occurrences based on training samples' indicator transforms (location and classes) and spectrally derived class probabilities, thus calibrating the a posterior class probability vectors derived from initial spectral classification. The results showed that classification accuracy is significantly increased by these two methods for utilizing spatial information contained in training samples and initial spectral classification, compared with those obtainable with spectral classification. Moreover, the proposed methods constitute a valuable strategy for making fuller use of information residing in training data for improving spectrally derived classification, which is independent of the specific classifiers initially adopted for image classification.

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