Band Selection from Hyperspectral Data for Conifer Species Identification

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Abstract
Hyperspectral data compression and dimension reducing are very important to computer processing and data transmission. A small number of bands, containing relatively large amount of spectral information, are usually sufficient to many application purposes. Therefore, how to select a small number of bands without loss of much information from all the bands is a critical issue. In this paper, a method of band selection using band prioritization with peak values of sum of 30-eigenvector pertinent to principal component analysis (PCA) was developed. An error back-propagation neural network (NN) algorithm was applied to evaluate the effectiveness of the band selection method in forest species recognition. The results show that, when entering NN with 6-20 bands selected from a total of 161 bands of hyperspectral data for identifying six conifer species, the average recognition accuracy improvement of 11.20% can be obtained using the new band selection method over the method of equal-interval band selection.