Comparison of Support Vector Machine and Neural Network Classification Methods in Land Use Information Extraction through Landsat TM Data

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Abstract

Land use classification and mapping mostly use remotely sensed data. During the past decades, several advanced classification methods such as neural network and support vector machine (SVM) have been developed. In the present study, Landsat TM images with 30m spatial resolution were used to classify land uses through two classification methods including support vector machine and neural network. The results showed that SVM and neural network with the total accuracy of 90.67 % and 91.67% are superior. SVM had a better performance in separating classes with similar spectral profiles. In addition, SVM showed a better performance in delineating class borders in comparison with neural network method. In summary, both SVM and neural network showed satisfactory results but the method of support vector machine proved better with a difference of 1% and 2% in overall accuracy and kappa coefficient, respectively. This was an expected outcome because SVMs are designed to locate an optimal separating hyperplane, while ANNs may not be able to locate this separating hyperplane.

Keywords: Remote sensing, land use, classification, neural network, support vector machine.

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