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.Location of Certain Clouds in the Landsat 7 ETM+ Support Vector Machines System Research

80% (the examined support vector machines) for the two main stages in the implementation of the studied areas, which is monitored by the total production of the support vector machines (19%).

Support Vector Machine (SVM) is a classification model that is used for classification and regression analysis. SVMs are widely used in various fields such as pattern recognition, data mining, and bioinformatics.

The SVM algorithm is based on the idea of finding a hyperplane that maximally separates the two classes of training data. This hyperplane is determined by the support vectors, which are the data points that are closest to the boundary between the two classes.

The SVM algorithm is particularly useful when the number of features is large compared to the number of training samples. In such cases, traditional statistical methods may not perform well due to the curse of dimensionality. SVMs, on the other hand, can handle high-dimensional data and are less prone to overfitting.

In this study, the researchers used the SVM algorithm to classify certain clouds in the Landsat 7 ETM+ satellite imagery. The SVM algorithm was trained on a set of labeled training data, and then tested on a separate set of unlabeled data.

The SVM algorithm was able to achieve an accuracy of 80% for the two main stages in the implementation of the studied areas. This high accuracy is due to the ability of SVMs to generalize well from a small amount of training data.

In conclusion, the SVM algorithm is a powerful tool for classification and regression analysis. It is particularly useful when the number of features is large compared to the number of training samples. The results of this study demonstrate the ability of SVMs to accurately classify certain clouds in satellite imagery.
Pattern Classification for Land Cover Analysis in Satellite Images

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ABSTRACT

Land cover classification is extremely important for land use planning and management. Pattern classification is a wide research area that can classify and analyze the Earth’s surface to study the natural resources and to understand many environmental phenomena.

This research aimed to apply pattern classification methods to classify satellite images into several land cover types such as water, plants, rocks, and desserts. This was done by presenting and implementing a proposed classification system.

Satellite images of two different study areas from Jeddah in Saudi Arabia were acquired by Landsat 7 ETM+.

This research presented the application of pattern recognition algorithm, the Support Vector Machines (SVM) that is a machine learning algorithm based on statistical learning theory. SVM carried out the process of classification, and gave promising results in land cover classification problem.

Ranklet transform is a recent image processing technique proposed and applied in this research as a feature extraction method. Ranklet transform is a multi-resolution and orientation selective approach similar to that of the wavelet transform; in addition, it is non-parametric that deals with the ranks of the pixels rather than with their gray-level intensity values. Ranklet coefficients as classification features could solve successfully the classification problem and gave superior results in classification performances.

Furthermore, with an accurate choice of the SVM parameters and of the resolutions at which the multi-resolution ranklet transform is performed, ranklet-based images achieved an improvement in accuracy (91%) over the pixel-based (84%) and wavelet-based (86%) images. Performance evaluation was the final step in the proposed classification system, which performed in term of accuracy.