A spatial classification technique incorporating a novel feature derivation method is proposed for classifying the heterogeneous classes present in the hyper spectral images. The classification accuracy can be improved if and only if both the feature extraction and classifier selection are proper. As the classes present in the hyper spectral image are having different textures, textural classification is entertained. Wavelet based textural features extraction is entailed. Hyper spectral images are having dozen numbers of bands. Few mutually distinct bands are selected and wavelet transform is applied. For all the sub bands Gray Level Co-occurrence Matrix (GLCM) are calculated. From GLCMs co-occurrence features are derived for individual pixels. Apart from Co-occurrence features, statistical features are also calculated. Addition of statistical and co-occurrence features of individual pixels at individual bands form New Features for that pixel. By the process of adding these New Features of approximation band and individual sub-bands at the pixel level, Combined Features are derived. These Combined Features are used for classification. Support Vector Machines with Binary Hierarchical Tree (BHT) is developed to classify the data by One Against All (OAA) methodology. Airborne Visible Infra Red Imaging Sensor (AVIRIS) image of Cuprite -Nevada field is inducted for the experiment.
A Novel Feature Derivation Technique for SVM based Hyper Spectral Image Classification

Reference

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Index Terms

Computer Science
Image Processing

Key words
Multi-class
Wavelet
Co-occurrence features
Feature Extraction
Feature derivation
Support Vector Machines