

عنوان مقاله:

Spatial-Spectral Classification of Hyperspectral Images Based on Extended Morphological Profiles and Guided Filter

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خلاصه مقاله:

Previous studies show that the incorporation of spatial features in the classification process of hyperspectral images (HSI) improves classification accuracy. Although different spatial-spectral methods are proposed in the literature for the classification of the HSI, they almost have a slow, complex, and parameter-dependent structure. This paper proposes, a simple, fast and efficient two-stage spatial-spectral method for the classification of the HSI based on extended morphological profiles (EMP) and the guided filter. The proposed method consists of four major stages. In the first stage, principal component analysis (PCA) is used to smooth the HSI to extract the low-dimensional informative features. In the second stage, EMP is produced from the first three PCs. Stacked feature vectors, consisting of PCs and EMP, are classified via support vector machines (SVM) in the third step. Finally, a post-processing stage based on a guided filter is applied to classified maps to further improve the classification accuracy and to refine the noisy classified pixels. Experimental results on two famous hyperspectral images named Indian Pines and Pavia University in a very small training sample size situation show that the proposed method can reach the high level of accuracies which are superior to some recent state-of-the-art methods.

کلمات کلیدی:

Extended Morphological Profiles, Guided Filter, Support vector machine, Principal Components Analysis, Hyperspectral, Classification

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