

Pure And Mixed Pixel Separation to Improve Classification Accuracy of the Hyperspectral Imagery

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Abstract

To classify images, most remote sensing softwares use either a pixel or sub-pixel based classification in the process of information extraction. The pixel-based methods which assume that all pixels within an image are all pure perform the classification by assigning a single class to each pixel. In contrast, sub pixel classification methods try to extract proportion of classes that are present in each pixel. Unfortunately both techniques assume that pixels are either pure or mixed, consequently this idea can lead to weak results.

In this paper, a new technique is presented which deals with each pixel with respect to its nature. As a first step, it is defined whether a pixel is pure or mixed. For this purpose, either an uncertainty measuring based or an edge detection based approach is used. Which the former is performed after classification and the later is applied before classification process. Once the mixed pixels are defined, the mixed ones are classified by Linear Spectral Unmixing (LSU), while the others are classified by Maximum Likelihood Classification (MLC). In order to evaluate the technique, a test were performed on AVIRIS image which collected from Indian Pine, a mixed forest/agricultural site . The results of this approach show that classification accuracy improved respect to the conventional information extraction process.