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INDEPENDENT COMPONENT ANALYSIS FOR CLASSIFICATION OF REMOTELY SENSED IMAGES

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Abstract. *We proposed a new method based on independent component analysis (ICA) for classification of remotely sensing images. We first extract independent components from the multi-spectral information by using ICA and then the extracted spectral independent components are used to classify the targets from the remotely sensed images. The proposed method has been successfully applied to IKONOS images and the classification performance has also been compared with conventional multi-spectral method and PCA-based method.*
Keywords: Independent component analysis, Classification of remotely sensed images, IKONOS images

1. **Introduction.** Remotely sensed data is a record of relative reflectances of particular wavelengths of electromagnetic radiation. Whether a particular target reflects specularly or diffusely, or somewhere in between, depends on the surface feature of the target and the wavelength of the incoming radiation. For example, fine-grained sand would appear fairly smooth to long wavelength microwaves but would appear quite rough to the visible wavelengths. Classification of Remotely sensed image based on its multi-spectral information has been the subject of environmental investigation. For example, by classifying the forested and unforested areas, we can easily make an estimation of how much forest was lost.

By classifying the response of reflective features of different targets we will be able to distinguish and segment the different targets of an area, but it would be hard when different targets reflect somewhat similarly in some wavelengths. For example, water and vegetation may reflect somewhat similarly in the visible wavelengths, and they would be classified into the same class.