Enhancements using Wavelet Transform in remote sensing image fusion

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In remote sensing the develoment of sensor systems have provided data with more quantity, quality and variability, making image data processing a means to apply mathematical methods to improve results already obtained, providing better information with the same data.

A feature of sensor systems is to provide panchromatic images with spatial resolution superior to multispectral images and the fusion of both seeks to improve the spatial resolution while trying to preserve the spectral content. There are several well known methods of image fusion, among which IHS, YUV and multiscale transform-based methods.

IHS type methods based on wavelet transform have generated excellent results in minimizing spectral distortions in the fusion process.

This work presents a study of the use of the wavelets transform in the fusion process of panchromatic and multispectral images from CBERS and Quickbird systems, comparing the use of color models like IHS, seeking to evaluate the maintenance of the original spectral characteristics. Besides the color model the contribution of transformations like CLAHE and the specification of histograms in the fusion process.

Keywords: Image Fusion, Remote Sensing, Wavelet Transform, IHS type color models.