Abstract

The paper focuses on image fusion between multi-spectral images and panchromatic images using a gradient based wavelet analysis method with image processing traits. For highlighting the core features of source images, pre-processing is accomplished. A new gradient technique is developed based on wavelet transformation. As of gradient process, for a multi-spectral image, every pixel having 4 neighbors of each of them. The summation that we do matches those of the multi-spectral images that we have selected. Two major considerations for gradient are considered. One is for the pixel values in the multi-spectral images region and other is the gradient pixel values that are at the boundary. Once we have calculated these values, we transfer these values from the multi-spectral images onto the panchromatic image and then rest of the values outside the mask are kept as same. Since we are working on the RGB images, we copied the RGB channels directly. By calculating bigger gradient of the two images either in multi-spectral images or panchromatic images and then construct the final image using inverse wavelet transformation. The proposed method is experimented on satellite, medical and natural images. In all the cases, this method shown superiority with existing methods.
References


**Index Terms**

Computer Science  
Image Processing

**Keywords**

Gradient, wavelet, fusion, Multi-spectral, pre-processing.