



A New Image Fusion Algorithm Based on Two Dimensional Empirical Mode Decomposition

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Abstract: High resolution color images from aerial photography or satellite are widely desired but often prohibitively expensive, particularly over large areas. On the other hand, monochromatic radar images at finer resolution with better horizontal accuracy are now available at relatively low cost over large areas. It would be desirable for many applications to create and use a fused product from the radar and a suitable multispectral source. The purpose of fusion process is synthesizing a new multispectral image whose bands coincide spectrally as much as possible with those of the original multispectral image, and having a spatial resolution comparable to the panchromatic image. In this paper, a new algorithm based on 2D EMD (two Dimensional Empirical Mode Decomposition) is presented. This method combines the high frequency IMFs (Intrinsic Mode Functions) of panchromatic (radar) image with optical image. The algorithm is implemented by using Envisat ASAR and Landsat ETM+ images of Manali region in Himachal Pradesh, India.

Keywords: 2D EMD, IMF, Image fusion, radar