Image fusion - a performance assessment

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Abstract: The information of an image is based on the spatial and spectral resolution of the imaging system. The image fusion technique is required to obtain both high spatial and high spectral resolution. This paper emphasizes the assessment and systematic analysis of image fusion techniques by measuring the quantity of enhanced information in fused images. The different measuring parameters such as Entropy, Correlation Coefficient, Mutual Information measure, Fusion Factor, Fusion Symmetry and Signal to Noise ratio along with the proposed parameter Fusion index are used for evaluating the performance of image fusion techniques. These parameters are employed on three image fusion techniques- Principal component analysis, Multiplicative merge and Brovey transform. The results are compared with the Wavelet transform technique. The comparative study indicates that Wavelet transform fusion technique provides not only a' better look' image but also preserves the spectral information content. The parameters evaluated for various fusion techniques prove that the Wavelet transform technique surpasses the other fusion techniques.

Keywords: Image fusion, Entropy, Mutual Information measure, Signal to noise ratio, Fusion factor.