An Improved Component-Substitution-Based Image Fusion Approach
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In this research, we propose the image fusion method compensated to create high resolution MS image more advanced and enhanced. The proposed method is based on the well-established component substitution (CS) approach. So we present a general scheme that can be applied to most of CS image fusion method and then point out that our method are different to previous algorithms.

Our method is organized into two parts. The first step is the construction of the intensity image as the weighted average of the MS image. The weights are obtained by using the linear regression algorithm between PAN and MS image, to reduce spectral mismatch between the intensity and PAN image. The next step is to produce the weighted high-frequency component, acquired by product of the optimal parameter and high-frequency component. The optimal parameters depend on the statistical properties of the high-frequency component of PAN image and the difference between the PAN and MS images.

This method is similar to the GSA method in that the intensity image is generated from average of the MS image weighted by using linear regression. It differs from in that the optimal parameter for the proposed method are used.

Various remote sensing satellite images, such as KOMPSAT-3, QuickBird and Worldview-2, are employed in the evaluation. The qualitative and quantitative results showed that proposed method can improve the spectral/spatial quality compared with the previous fusion algorithms.