QUALITY ASSESSMENT OF IMAGE FUSION TECHNIQUES FOR MULTISENSOR HIGH RESOLUTION SATELLITE IMAGES (CASE STUDY: IRS-P5 AND IRS-P6 SATELLITE IMAGES)

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ABSTRACT:

This paper is concentrated on the evaluation of the image fusion techniques applied on the IRS P5 and P6 satellite images. The study area is chosen to cover different terrain morphologies. A good fusion scheme should preserve the spectral characteristics of the source multi-spectral image as well as the high spatial resolution characteristics of the source panchromatic image. In order to find out the fusion algorithm which is best suited for the P5 and P6 images, five fusion algorithms, such as Standard IHS, Modified IHS, PCA, Brovey and wavelet algorithms have been employed and analyzed. In this paper, eight evaluation criteria are also used for quantitative assessment of the fusion performance. The spectral quality of fused images is evaluated by the Spectral discrepancy, Correlation Coefficient (CC), RMSE and Mean Per Pixel Deviation (MPPD). For the spatial quality assessment, the Entropy, Edge detection, High pass filtering and Average Gradient (AG) are applied and the results are analyzed. The analysis indicates that the Modified IHS fusion scheme has the best definition as well as spectral fidelity, and has better performance with regard to the high textural information absorption. Therefore, as the study area is concerned, it is most suited for the IRS-P5 and P6 image fusion.

TOPIC: Data fusion and data assimilation
ALTERNATIVE TOPIC: Change detection and process modelling