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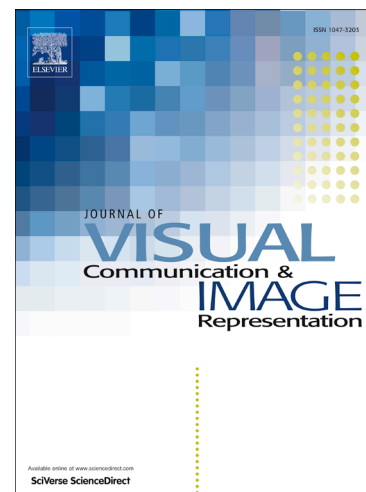
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Fusion of Hyperspectral and Panchromatic Images Using an Average Filter and a Guided filter

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Abstract. The fusion of hyperspectral and panchromatic images aims to generate a fused image with high spatial and high spectral resolutions. This paper proposes a novel hyperspectral pansharpening method using an average filter and a guided filter. Based on the traditional component substitution methods, we propose a new and simple method to extract the spatial information of the HS image by average filtering at first. Then to solve the significant spectral distortion, a guided filter is utilized to obtain more detailed spatial information from the PAN image which has been sharpened. The appropriate injection gains matrix is generated by selecting the optimal value of the tradeoff coefficient. The spatial detail is finally injected into each band of the interpolated HS image to achieve the fused image. Experimental results demonstrate that the proposed method can obtain more spatial information and preserve more spectral information in both subjective and objective evaluations.

Keywords: Hyperspectral (HS) image, panchromatic (PAN) image, guided filter, average filter, component substitution (CS).

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1 Introduction

Image fusion is a process which can synthesize and extract the information of two or more different images to obtain improved information by using a certain algorithm [1]. Remote sensing image fusion is an important part of image fusion. Remote sensing image fusion aims to combine the information of different spectral and spatial resolutions images to achieve more

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