THE CURRENT PROGRESS ON WAVELET BASED IMAGE FUSION

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Abstract

This paper describes and explains why image fusion, what is image fusion, and the current research status mainly on wavelet based pixel-based image fusion. Pixel-based image fusion defines the fusion process of original images or the images after pre-processing. Preliminary results of many researches show that the advantages of high-resolution panchromatic image and low-resolution multi-spectral image can be combined by image fusion and the information extraction capability can be improved. The fusion methods evolutes from traditional fusion methods, pyramid based fusion methods to nowadays wavelet based fusion methods. The popular wavelet theory based Mallat algorithm and "á Trous" algorithm are explained. In order to overcome some shortcomings of Mallat algorithm and "á Trous" algorithm. MRAIM algorithm is designed, which is based on the image formation principle and multi-resolution analysis theory. It formulates the Mallat algorithm and "á Trous" algorithm from the theoretical point of view. It can improve the spatial resolution while preserve the hue and saturation unchanged.