Haar Wavelet-Based Fusion of Multiple Exposure Images for High Dynamic Range Imaging

- Vivek Ramakrishnan &
- D. J. Pete

Abstract

Compositing multiple exposure images with different exposure values has attracted lot of attention in the field of computational photography. There are lot of approaches to fuse multiple exposure images, in various domains like the transform domain and filtering-based approaches. Out of these, we propose here a Haar wavelet-based transform domain approach for fusing multiple exposure images. The input image stack is first sub-divided into a four layer decomposition comprising of the average, horizontal, vertical, and diagonal blocks. Then, each of the corresponding blocks is fused using a fusion rule using a coefficient matrix and then averaged. The Haar wavelet-based decomposition results in orthonormal basis functions over unit intervals which helps in processing high-frequency regions in the image stack. We get a good compression efficiency using Haar wavelets which can be used further to build compressed HDR images in HDR photography. We avoid multi-scale and pyramidal decompositions and determination of quality parameters, such as hue, saturation, and well-exposedness, thus reducing the computational and coding complexities.

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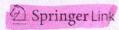SN Computer Science **3**, Article number: 129 (2022) | Cite this article

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