**Fusion of MRI and CT images using guided image filter and image statistics**

**ABSTRACT**

In medical imaging using different modalities such as MRI and CT, complementary information of a targeted organ will be captured. All the necessary information from these two modalities has to be integrated into a single image for better diagnosis and treatment of a patient. Image fusion is a process of combining useful or complementary information from multiple images into a single image. In this article, we present a new weighted average fusion algorithm to fuse MRI and CT images of a brain based on guided image filter and the image statistics. The proposed algorithm is as follows: detail layers are extracted from each source image by using guided image filter. Weights corresponding to each source image are calculated from the detail layers with help of image statistics. Then a weighted average fusion strategy is implemented to integrate source image information into a single image. Fusion performance is assessed both qualitatively and quantitatively. Proposed method is compared with the traditional and recent image fusion methods. Results showed that our algorithm yields superior performance.

***K E Y W O R D S*** brain, guided image filter, image fusion, image statistics, medical