

ABSTRACT

Similarity measure is an important thing in image registration. In this study the authors measured the similarity of the two images, one of which was registered where the first image became the groundtruth. Similarity measure have been studied previously with many methods with good results, but there are still some gaps where similarity measurements cannot be applied in all conditions.

Sparse Representation (SR) is one method in measuring similarity in image registration where this method counts the sparseness' index of images. The advantage of this SR method is the accuracy of the similarities of the input images that can be counted well. The SR method is also strong enough to handle images in a large intensity of distortion, which is often found in medical images, long distance images caused by differences in acquisition modalities and illumination conditions.

The results obtained in this study include the value of *Root Mean Square Error* (RMSE) with the smallest value is 39,5825 from the perfect value os 0, the value of *Peak Signal to Noise Ratio*(PSNR) with the largest value is 16,181 *dB*, the value of the *Structural Similarity Index* (SSIM) is 0,8318 when the perfect value is 1, the value of *Correlation Coefficient* (CC) with the largest value is 0,732 when the perfect value is 1, and the value of *Coherence* with the smallest value is 0,268 when the perfect value is 0.

Keywords: Image registration, sparse representation, panchromatic image, multispectral image, simmilarity measure