

International Conference on

Medical Imaging & Diagnosis

October 20-21, 2016 Chicago, USA

Medical image fusion: applications, approaches and evaluation

Rajiv Singh

Banasthali University, India

Medical image processing is a rapidly growing area of research for the last three decades. X-ray, ultrasound, MRI (magnetic resonance imaging) and CT (computed tomography) are a few examples of medical imaging sensors which are used for extracting clinical information. These sensors provide complementary information about patient's pathology, anatomy, and physiology. For example, CT is widely used for tumor and anatomical detection, whereas information about soft tissues is obtained by MRI. Similarly, other medical imaging techniques like fMRI (functional magnetic resonance imaging), PET (positron emission tomography), SPECT (single positron emission computed tomography) provide functional and metabolic information. Further, T1-MRI image provides details about anatomical structure of tissues, whereas T2-MRI image gives information about normal and abnormal tissues. Hence, one can easily conclude that none of these modalities is able to carry all relevant information in a single image. Therefore, multimodal medical image fusion is required to obtain all possible relevant information in a single composite image for better diagnosis and treatment. Spatial and transform domain approaches have been widely used for medical image fusion. These techniques include PCA (principal component analysis), linear fusion etc., and multiresolution fusion scheme using wavelet and pyramid transforms. Subjective and objective evaluations are the two possible ways to assess fusion algorithms. Subjective evaluation can be performed by medical experts, whereas for objective evaluation, reference and non reference metrics have been used. For medical image fusion, non-reference metrics are more suitable as we do not have any reference medical image for comparison of fused image. However, combined subjective and objective evaluation of fusion algorithms has been found beneficial for better analysis of fusion results.

Biography

Rajiv Singh is an Assistant Professor at the Department of Computer Science, Banasthali University, Banasthali, Rajasthan, India. His research areas of interest are medical image processing, computer vision, information fusion and wavelet analysis. He has published several papers in refereed journals and conferences. He has served as reviewer for reputed journals like Information Fusion, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Image Processing, IET Image Processing and many conferences. He is a member of IEEE and ACM.

jkrajivsingh@gmail.com

Notes: