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Abstract:
Multimodal Medical fusion imaging is a salient feature not only in image-guided medical diagnosis but also treatment and various computer guided medical procedures. This paper proposes an efficient medical fusion imaging system that is evolved from the concept of Non-Subsampled Shearlet Transform (NSST) and the Gray Wolf Optimization (GWO) technique. Optimum decomposition level is determined by GWO technique and the optimum gain parameters. Finally, one more procedure is added to the entire procedure known as denoising and enhancement process is carried out to improve its

visual quality and improve detailing. Work performance of these traditional fusion techniques are hampered greatly in cases when the images are corrupted with noise. Hence there is a need to develop a fusion technique that is capable of preserving precise information even when images are corrupted. It is also challenging to achieve suppressed noise and enhanced textural simultaneously. This proposed work is a study to compare traditional spatial, transform, filter and neural network domain fusion techniques with optimized NSST fusion imaging.

☰ Contents

I. Introduction

Medical imaging has been the most critical and vital part of modern health care practices. Now a days, medical image processing is highly essential for patient management system starting from diagnosis to post-treatment analysis. The diagnosis of the disease involves non-invasive acquisition of information about the human body organs through imaging. There are many modalities available for capturing the data from affected part of the body. These are based on the physics used in the acquisition process. CT provides the information related to calcifications, bone structures, tumour outline prominently. MRI is predominant and most effective diagnostic procedure in assessing soft tissue anatomy. PET and SPECT images give abnormal metabolism at cancer infected tissues. Thus, every modality may not exhibit all the necessary information related to a particular dis ease. The acquisition of combined details regarding different modalities with a single machine is unavailable in almost all the health centres. The new PET- MRI scanner is under development stage [1]. Therefore, there is social and urgent need to have a software solution which will provide combined information from different imaging modalities in a single frame with the minimum cost. Such software solution is called Multimodality medical fusion imaging (MMIF) [2].

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