ABSTRACT

CERTAIN INVESTIGATIONS ON THE ANALYSIS OF MAGNETIC RESONANCE IMAGING (MRI) AND COMPUTER TOMOGRAPHY IMAGING (CT) MEDICAL IMAGES OF BRAIN USING WAVELET BASED TRANSFORMS

Medical image analysis is the recent upcoming research area. Medical images namely Magnetic Resonance Imaging (MRI) and Computer Tomography (CT) are considered for this research work. Three major image processing application have been taken for medical image analysis (1) Image Fusion, (2) Image Denoising and (3) Image Compression. Each application has been undergone with transforms like Wavelet Transform, Ridgelet Transform, Curvelet Transform and Contourlet Transform.

The use of image fusion techniques has gained significant popularity over the past decade. Medical image fusion is the process of combining relevant information from several images into one image.. The fusion of MRI image and CT image of the same organ is to obtain a single image containing as much information as possible about that organ for diagnosis. CT images are mainly employed to visualize dense structures such as bones. On the other hand, MRI images are used to depict the morphology of soft tissues. The final output image can provide more information than any of the single images. Medical image fusion try to solve the issue of where there is no single modality provides both anatomical and functional information. The main objective of medical image fusion is to obtain a high resolution image with as much details as possible in a single image for the sake of diagnosis.

The objective of image compression is to reduce irrelevance and redundancy of the image data in order to able to store or transmit data in an efficient form. Image Compression is a widely addressed research area. Many compression standards have been in place. But still there is a scope for higher compression with quality reconstruction.

In order to analyse the efficient transform among the transforms used for compression, three parameters such as Compression Ratio (CR), Mean Square Error (MSE) and Peak Signal to Noise Ratio (PSNR) can be calculated