MATLAB PROJECT ABSTRACTS

((Image Processing, Wireless Sensor Network, Power Electronics, Signal Processing, Power System, Communication, Wireless communication, Geoscience & Remote sensing)

2015 IEEE BIOMEDICAL PROJECT LIST BASED ON MATLAB

1. Medical Image Fusion by Combining SVD and Shearlet Transform

The method of incorporating information from multiple images into a single image to get enhanced imaging quality and reduce randomness and redundancy in medical images for diagnosis and assessment of medical problems. In this paper, we present a new technique for medical image fusion using Singular Value Decomposition (SVD) method on Shearlet Transform (ST) domain to improve the information content of an image by fusing images like positron emission tomography (PET) and magnetic resonance imaging (MRI) images. The proposed method first transforms the source image into shearlet-image by using Shearlet Transform (ST). Then, we have used SVD model in lowpass sub-band and selected modified sub-bands according to their local characteristics. The composition of different high-pass subband coefficients are processed by ST decomposition.Then the high and the low sub-band are fused. Finally, the fused image is reconstructed by performing the inverse shearlet transform (IST). We have used three benchmark images to carry out our experiment and compare with many state-of-art techniques. Experimental results demonstrate that the proposed method outperforms many state-of-the-art techniques in both subjective and objective evaluation criteria.

2. PET and MRI Brain Image Fusion Using Wavelet Transform with Structural Information Adjustment and Spectral Information Patching

In this paper, we present a PET and MR brain image fusion method based on wavelet transform for low- and high-activity brain image regions, respectively. Our method can generate very good fusion result by adjusting the anatomical structural information in the gray matter (GM) area, and then patching the spectral information in the white matter (WM) area after the wavelet decomposition and gray-level fusion. We used normal axial, normal coronal, and Alzheimer's disease brain images as the three datasets for testing and comparison. Experimental results showed that the performance of our fusion method is better than that of IHS+RIM fusion method in terms of spectral discrepancy (SD) and average gradient (AG). In fact, our method is superior to IHS+RIM method both visually and quantitatively.

3. Image processing techniques for the enhancement of brain tumor patterns

Brain tumor analysis is done by doctors but its grading gives different conclusions which may vary from one doctor to another. So for the ease of doctors, a research was done which made the use of software with edge detection and segmentation methods, which gave the edge pattern and segment of brain and brain tumor itself. Medical image segmentation had been a vital point of research, as it inherited complex problems for the proper diagnosis of brain disorders. In this research, it provides a foundation of segmentation and edge detection, as the first step towards brain tumor grading. Current segmentation approaches are reviewed with an emphasis placed on revealing the advantages and disadvantages of these methods for medical imaging applications. The use of image segmentation in different imaging modalities is also described along with the difficulties encountered in each modality.

4. Brain Segmentation using Fuzzy C means clustering to detect tumour Region

Tumor Segmentation from MRI data is an important but time consuming manual task performed by medical experts. The research which addresses the diseases of the brain in the field of the vision by computer is one of the challenges in recent times in medicine, the engineers and researchers recently launched challenges to carryout innovations of technology pointed in imagery. This paper focuses on a new algorithm for brain segmentation of MRI images by fuzzy C means algorithm to diagnose accurately the region of cancer. In the first step it proceeds by nioise filtering later applying FCM algorithm to segment only tumor area. In this research multiple MRI images of brain can be applied detection of glioma (tumor) growth by advanced diameter technique