Intuitionistic Fuzzy Segmentation of Brain MRI

ABSTRACT

Intuitionistic fuzzy set (IFS) involves the concept of non-membership degree and hesitation degree. The application of IFS is crucial in medical imaging as the images are poor in illumination as well as the structure is hard to detect. This work is focusing on segmenting brain MRI images by using advanced fuzzy and ordinary fuzzy theory. One of the intentions in image segmentation is to divide the regions in an image so that it is easier to be analyzed as it extracts meaningful information. In addition, the main highlight in this work is to apply IFS concept in focal brain parenchymal lesions image segmentation. The method is known as intuitionistic fuzzy c-mean (IFCM). Furthermore, the output images by using IFCM and fuzzy c-mean (FCM) are compared. Based on the results, IFCM has better outcomes in term of accuracy and performance test compared to FCM. Hence, the IFCM has better results in segmenting the focal brain parenchymal lesions images compared to FCM since it is able to preserve the surrounding structure of the brain.