Segmentation of FLAIR Magnetic Resonance Brain Images using K-Means Clustering Algorithm

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ABSTRACT

Brain segmentation is a process of segmenting brain from the non-brain components. It is also equivalent to skull stripping or brain extraction where the objective is to extract only brain tissue components. It is important to segment brain from the non-brain components since it is a preliminary step in any further brain analysis and it will contribute great importance for extension in clinical study. This project is about segmentation of FLAIR brain Magnetic Resonance Image (MRI) using K-Means Clustering algorithm. A prototype system of brain segmentation is developed by implementing K-Means Clustering algorithm. Numbers of clusters, K are determined manually and the difference between pixel grayscale values is used for measuring similarities. Mean calculation is used for calculating new centroid values during each iteration. The clustering process is continued until the centroid values no longer move. Experiments are conducted and the prototype system is tested with 30 FLAIR brain MRI. Results from the experiments showed that the prototype system managed to obtained 75.93% accuracy rate from the segmentation. This research can be improved in future by hybrid K-Means Clustering algorithm with any existing segmentation techniques.

Keyword: Brain segmentation, K-Means Clustering, FLAIR brain MRI.

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