Journal Homepage: -www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI:10.21474/IJAR01/2410
DOI URL: http://dx.doi.org/10.21474/IJAR01/2410
ISSN NO. 2320-5407

RESEARCH ARTICLE

COMPARATIVE ANALYSIS OF DIFFERENT ALGORITHM FOR BRAIN TUMOR DETECTION.

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Manuscript Info

Manuscript History

Received: 20 October 2016
Final Accepted: 22 November 2016
Published: December 2016

Key words:-
k-means, FCM, Region growing, Watershed segmentation, Image processing.

Abstract

An automatic MRI image processing algorithm used for k-means, histogram thresholding with FCM, region growing ,watershed segmentation, The paper present three techniques for detection purpose, Histogram, thresholding , k-mean, region growing , watershed segmentation. The segmentation of the brain tumor in magnate resonance images(MRI) is a challenging and difficult task because of Varity of their possible shapes , location , image intensifiers. This paper proposed method is more accurate and effective for the brain tumor detection segmentation for MRI images. This paper gives an comparison of various algorithm used for automatic MRI detection and its efficient.

Introduction:-

Brain has a very complex structure and is considered as a kernel part from the body. In this paper we proposed a process for brain tumor classification and detection, focusing on the analysis of MR images. The performances of these approaches. Usually depends on the accuracy of the segmentation techniques. Brain tumor segmentation in MRI image has become an emergent research area in the field of medical imaging system.

Proposed Technique:-

This component illustrates the overall technique of our proposed detection and identification of brain tumor through Magnetic Resonance (DICOM) Image using Histogram Thresholding, Region growing and K-mean segmentation. There purposed techniques are given below:

Histogram Thresholding:-

In image processing, the Histogram Thresholding method (HT) is a very simple method used for automatic image Thresholding.. This approach assumes that the image is divided in two main classes: The background and the foreground. The HT method tries to find the optimum threshold level that divides the histogram in two classes. Histogram thresholding is used by the Object Extraction, Background and Image Factory (segmentation) tools to select a range of pixel values that should match to what you want to select in the image. Thresholding is a technique for converting a grayscale or color image to a binary image based upon two threshold values. The histogram presents the frequency of intensity values of a channel in an image. The threshold values (min and max) can be applied by moving the arrows above the histogram or by using an automatic threshold method.

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K-MEAN:-
K-means is a method of vector quantization, originally from signal processing, that is popular for analysis in segmentation. K-means aims to partition n observations into k clusters in which each observation belongs to the cluster with the nearest mean, serving as a prototype of the cluster. This results in a partitioning of the data space into Voronoi cells. The problem is computationally difficult; however, there are efficient heuristic algorithms that are commonly employed and converge quickly to a local optimum. These are usually similar to the expectation-maximization algorithm for mixtures of Gaussian distributions via an iterative refinement approach employed by both algorithms. Additionally, they both use cluster centers to model the data; however, k-means clustering tends to find clusters of comparable spatial extent, while the expectation maximization mechanism allows clusters to have different shapes.

FCM:-
In fuzzy clustering, every point has a degree of belonging to clusters, as in fuzzy logic, rather than belonging completely to just one cluster. Thus, points on the edge of a cluster may be in the cluster to a lesser degree than points in the center of cluster. An overview and comparison of different fuzzy clustering algorithms is available. Clustering approach is widely used in biomedical applications particularly for brain tumor detection in abnormal magnetic resonance (MRI) images. Fuzzy clustering using fuzzy C-means (FCM) algorithm proved to be superior over the other clustering approaches in terms of segmentation efficiency. But the major drawback of the FCM algorithm is the huge computational time required for convergence. The effectiveness of the FCM algorithm in terms of computational rate is improved by modifying the cluster center and membership value updating criterion.

Region growing:-
Region growing is a region-based image segmentation method. It is also classified as a pixel-based image segmentation method. This approach to segmentation examines neighboring pixels of initial seed points and determines whether the pixel neighbors should be added to the region. Region growing methods can correctly separate the regions that have the same properties we define. It provides the original images which have clear edges with good segmentation results. The concept is simple. We only need a small number of seed points to represent the property we want, and then grow the region. We can determine the seed points and the criteria we want to make.

Watershed:-
In image processing, different watershed lines may be computed. In graphs, some may be defined on the nodes, on the edges, or hybrid lines on both nodes and edges. Watersheds may also be defined in the continuous domain. There are also many different algorithms to compute watersheds. The main improvements in our work are Histogram Thresholding. Creative Commons Attribution CC BY divided in two main classes: The background and the foreground. With the help of this we can easily detect and segment the MR images. The improvement is based on automatic utilization of specified regions of interest within the tumor area in the MRI images using HT, region growing.

Conclusion:-
We proposed five types of approaches for Brain tumor detection, identification and classification. We proposed detection and identification of brain tumor through Magnetic Resonance (DICOM) Image using Histogram Thresholding, K-mean segmentation, FCM, Region growing and Watershed Segmentation. Creative Commons Attribution CC BY showed its ability to accurately detect and identify the contour of the tumor, its computational time and accuracy were much less than its corresponding algorithms. For future we enhance our result using other Algorithm and calculate more parameters also.

References:-
1. Pankaj Sapra, Rupinderpal Singh, ShivaniKhurana"Brain Tumor Detection Using Neural Network"International Journal of Science and Modern Engineering (IJISME) ISSN: 2319-6386, Volume-1, Issue-9, August 2013
2. Manoj K Kowar and SourabhYadav " Brain Tumor Detction and Segmentation Using Histogram Thresholding" International Journal of Engineering and Advanced Technology (IJEAT) ISSN: 2249 – 8958, Volume-1, Issue-4, April 2012 16
3. M.G. Masoole and A. S. Moosavi. "An Improved Fuzzy Algorithm for Image Segmentation". World Academy of Science, Engineering and Technology Vol. 38. 2008. Pp. 400-404.

4. M. Zhang, K. E. Sakaieand and S. E. Jones, "Toward whole-brain maps of neural connections: Logical framework and fast implementation," IEEE MMBIA, pp.193-197, 9-10 Jan. 2012.
5. L. Jiang and W. Yang. “A Modified Fuzzy C-Means Algorithm for Segmentation of Magnetic Resonance Images”. Proc. VIIth Digital Image Computing: Techniques and Applications. Sydney 10-12 Dec. 2003.