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VHDL Implementation Using Clustring Algorithm

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***Abstract* – This paper deals with a new approach for image segmentation of brain image by applying k-means clustering algorithm for detection of tumor. Manual segmentation of brain tumor is time consuming and challenging task. In image segmentation, clustering algorithms are very popular as they are intuitive and implementation is easy. One of the most widely used algorithms in the literature is the K-means clustering algorithm. This paper proposes a color-based segmentation method that uses K-means clustering technique. In k-means algorithm partition of an image is takes places into k clusters. The K-Means algorithm produces accurate segmentation results only when applied to images defined by homogenous regions with respect to color. At first, the pixels are clustered based on their color. After clustering of pixels clustered blocks are merged to a specific number of regions. This approach provides a useful new solution for image segmentation in which tumor is detected. At the end of the process the tumor is extracted from the MIR or CT scan image and tumor position determined. It clarify the effectiveness of our approach to improve the segmentation quality in aspects of precision and computational time.**

***Keywords*:** *K-means Algorithm, Clustering, Segmentation.*

I. INTRODUCTION

In the evolution of healthcare services, there is an increasing need for greater effective use of imaging data in medical diagnosis and treatment selection and disease prevention. Normally the anatomy of the Brain can be viewed by the MRI or CT scan. In this paper the MRI scanned image is taken for the entire process. The MRI scan is better than CT scan for diagnosis. The human body does not affected by it because it is based on the magnetic field and radio waves and there is no use of any radiation. Many algorithm were developed for brain tumor detection.

In this paper, K-means clustering algorithms are used for segmentation. It gives the accurate result for tumor segmentation. Brain tumors are formed due to uncontrolled growth of abnormal cells. Basically brain tumor is divided into two types. Primary Brain Tumor which originates in the brain and rarely spread outside of it. Second Metastatic Brain Tumor which begins in some other part of the body and spreads to the brain. Segmentation is the core of digital image processing. It is the most important and complicated stage. As for the case of brain tumor, segmenting a tumor out of brain is not an easy task.

Clustering algorithms are based upon the index of similarity or dissimilarity between pairs of data points. clustering approaches were one of the first techniques used for the segmentation of natural images. In partition clustering the goal is to create one set of clusters that partitions the data in to similar groups. In our work we have used K-means clustering approach for performing image segmentation using Matlab software.

II. PREVIOUS SYSTEM

The previous method is based on the thresholding and region growing. The spatial characteristics were ignored by the thresholding method. Normally spatial characteristics are important for the malignant tumor detection. The thresholding based segmentation contains the image which has only two values black or white. But the bit map image provide 0 to 255 gray scale values due to this sometimes it ignores the tumor cells also. If there is region growing based segmentation for the selection of the seed there is need of more user interaction. The center of the tumor cells is known as seed and it may cause intensity in homogeneity problem. Thus it will not provide the acceptable result for all the images.

III. PROPOSED METHOD

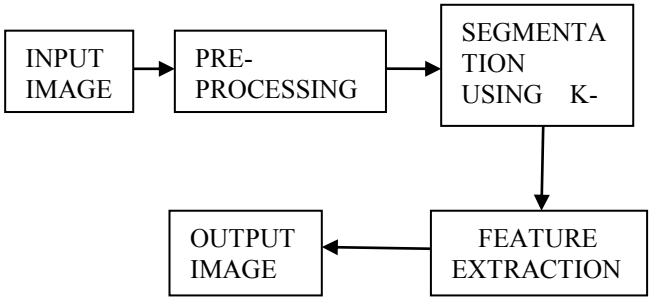

Fig 1.Block Diagram

A. PRE-PROCESSING

In this stage filtering of noise and RGB to grey scale conversion of an image takes place. It includes median filter for noise removal. The arrival of noise in modern MRI scan is

minimum. The main aim of this paper is detection and segmentation of the tumor cells but for the complete system it needs the process of noise removal. For better result the function of median filter, salt and pepper noise is added artificially and median filter is used for removing of noise.

B.CLUSTERING

A clustering algorithm attempts to find natural groups of components based on some similarity.

Clustering algorithm finds the centroid of a group of data sets.

K-MEANS CLUSTERING

One of the unsupervised learning algorithm for clustering is K-Means. Grouping the pixels according to some characteristics is nothing but clustering.

FLOWCHART OF K-MEANS ALGORITHM

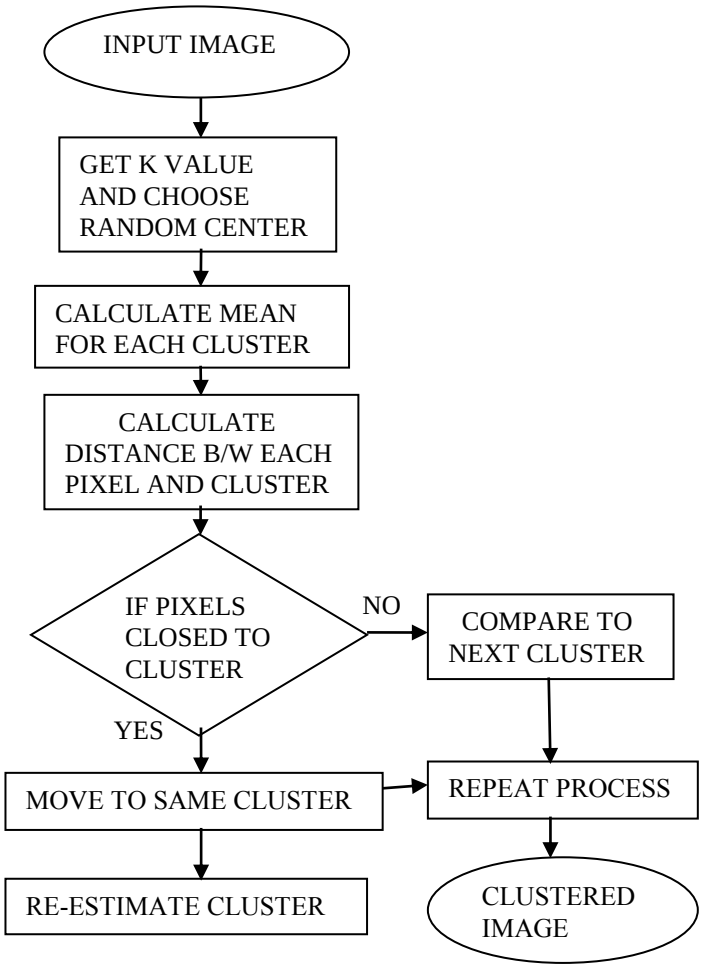

Fig.2 K-means flowchart

In the k means algorithm initially we have to define the number of clusters k. Then center of k cluster are selected randomly. The k means clustering algorithm is used to measure distance between the each pixel to each cluster centers.

The distance may be of simple Euclidean function. For comparison of single pixel and all cluster centers the distance formula is used. The pixel is moved to cluster which has shortest distance among all. After re-estimation of centroid each pixel is compared to all centroids. This process repeats until the center converges.

C. FEATURE EXTRACTION

The feature extraction is extracting the cluster. The extracted cluster is given to the thresholding process. After applying binary mask over the entire image the dark pixel become darker and white become brighter. In thresholding, each transform coefficient is compared with a threshold and if it is less than the threshold value then it is assume as zero. If it is larger than the threshold, it will be assume as one. The thresholding method is an adaptive method where only those coefficients whose magnitudes are above a threshold are retained within each block. Consider an image 'f that have the k gray level. The threshold value T, which lies in the gray scale range of k. In thresholding process comparison of each pixel in 'f ' and T takes place. According to that binary decision is made. The value of the particular pixel in output binary image 'g' is defined by it which is given below:

g (n) ='0' if f(n) >= T
g (n) ='1' if f(n) < T [1]

Feature extraction has been done using image processing tool i.e. Matlab. The advantage of k-means algorithm is that it works well when clusters are not well separated from each other, which is frequently encountered in image. Clustering algorithm is applied over this extracted feature to form the group.

IV. IMPLEMENTATION FLOW

1. Start
2. Load the Image
3. Enter k segmentation count
4. Transmit image to FPGA
5. Image received by FPGA
6. Apply K-means clustering algorithm
7. Calculate the initial centroids by using algorithm
8. Follow General K-means algorithm for sub samples
9. Reduce clusters K TO K by Combining centroids
10. Divide the sample to multiple sub samples
11. Reshape the clusters into Image
12. Retransmission of image.
13. Display result.
14. STOP.

The RGB or grayscale image scanning is take place by this algorithm and converts the image into binary image by Binarization technique and detects the edge of tumor pixels in the binary image.

V. CONCLUSION

Scientists have found various types of tumours. Sometimes there is a mass in brain or there is malignant around the brain .Suppose if it is a mass then K- means algorithm is use to extract it from the brain cells. In this if noise is detected then it is extracted before the k means and this image is given as input to the k-means and tumour is extracted from the MRI image. Image segmentation divides an image into a number of discrete regions such

that the pixels have high similarity in each region and high contrast between regions. The experimental results are compared with other results. This method gives better result.

REFERENCES

[1].J.Selvakumar,A.Lakshmi,T.Arivoli," Brain Tumor Segmentation and it's Area calculation in Brain MR images
using K means clustering and fuzzy means algorithm", IEEE-International Conference On Advances In Engineering, Science And Management (ICAESM -2012) March 2012.

[2]Ayesha Amir Siddiqi, Dr. Attaullah Khawaja Mashal Tariq, Department of Electronics N.E.D. University of Engineering and Technology ,"3D volume representation of brain tumor using Image Processing", IEEE International Conference on Signal and Image Processing Applications (ICSIPA2011).

[3] Phooi Yee Lau, *Student Member, IEEE,* Frank C. T. Voon, and Shinji Ozawa, *Member, IEEE,* "The detection and visualization of brain tumors on T2-weighted MRI images using multiparameter feature blocks", Proceedings of the 2005 IEEE Engineering in Medicine and Biology 27th Annual Conference Shanghai, China, September 1-4, 2005.