Abstract

Tumor is a swelling of a part of the body, generally without inflammation, caused by an abnormal growth of cells it is also known as cancerous growth and decontrol growth and they also have different treatment. There are many types of algorithm which were developed to cure brain Tumour detection. But few of them have different drawbacks for extraction and detection process. After the segmentation process which has been taken by fuzzy c-means and k-means clustering by doing this process the detection and extraction location are identified. By differentiate the other algorithms the operations of fuzzy c-mean plays a major role. The victim's stage is determined by this process, it maybe rectify by medicines or not. This paper is to implement of few Algorithms for rooting out the distance and the shape of tumour in brain by using MRI Images. Usually result of this process can be viewed by first doing CT scan or by MRI scan. In this paper Magnetic Resonance Imaging scanned image is basically used for this whole procedure, For identifying purpose Magnetic Resonance Imaging scan is more accurate than any other scan it will never affect our human body reason for this is it doesn't require any radiation It is centered on the magnetic field and radio waves.
1. Introduction
A tumor can be primary and secondary. If it is a starting stage, then it is known as primary. If the growth of the tumor spread increasingly then it is called as secondary. Doctor gives the treatment for the strokes rather than the treatment for tumors. So tumor detection is important for this treatment. If the tumor is detected at an early stage the life expectancy of the person affected by the brain tumor will increase. Normally these cells are of two types Mass and Malignant. But the detection of the malignant infected cells is difficult to mass tumor. This paper focuses on the detection of mass tumor. The development platform for the detection is java. And at the end we are providing systems that detect the actual size of the tumor where it forms. An image is an matrix of square pixels arranged in rows and columns. In processing of an image the input is an image and the output is an image processing may be either an image.

The techniques for image processing is treating the images a two-dimensional signal and then applying a standard signal processing to it. The image will be ranging from 1 to 256 each and the brightness values also ranging from 0.e black to 255.e white. A 3D image is a collection of a large array of separate dots, each of which has a brightness related with it. The main task of our paper is to design a system which can detect accurate infected cells and separate those cells from the healthy one. The main benefits of this are the efforts of the doctor will get reduce, accurate result will be displayed by applying K-Mean algorithm, image processing is also fast and quick identification of tumor is possible. The main problem is the MRI technique is used for the monitoring the images of brain part which is damaged. In this MRI the images (1 and 2) are shown in the form of gray scale images and the image (3) shows the RGB component, this RGB component is not visible in the MRI. The images shows the parietal section of the head in this the Cerebrum is shown in the form of gray color while the veins and the artery in the form of cream is white color. And any clotting the brain that causes some sort of damage can be detected as dark gray.

Thus there is need to convert this images in the gray scale images and then extract those parameters from it. This extraction is like taking out an each pixel information and then plotting it, in MRI those images are seen in this manner tumor appears white and the black color for brain whose cells are damaged totally, thus the values of the pixel of showing those brain damaged cells are 0 and tumor is of 1.

2. Existing System
The image processing is one way of information processing in which the input in this system is taken as image. This system is normally based on threshold or region growing task. In Threshold segmentation basically a t image has two values black or white and we also know the bit image contains 0 to 255 values, so it ignores the tumor cells also. In this region growing selection of the
seed it needs more interaction seeds are nothing but the centric of the tumor cells due to this intensity in homogeneity problems has been generated. It will not provide any acceptable result for images.

2.1 Thresholding process
- Thresholding is the simplest method of image segmentation.
- Thresholding based segmentation the image is considered as having only two values either black or white i.e. binary image

2.2 Region Growing Segmentation
Region growing is a procedure in which pixels are grouped into larger region based on some predefined condition. The basic approach is to select a seed point (a pixel from where we begin) and grows region from this seed pixel. Let us take up an arbitrary pixel \((x_1,y_1)\) from the image that needs to be segmented. This pixel is called the seed pixel.
Now examine the nearest neighbour of \((x_1,y_1)\) one by one using 4 or 8 connectivity. The neighboring pixel is accepted in the same region as \((x_1,y_1)\) if they together satisfy the predefined condition[1]

3. Proposed System
In this paper these system contains four main task they are as follows:-
- Pre-processing
- Segmentation of k-mean and Fuzzy C-mean Algorithm.
- Feature extraction
- Approximate reasoning
Let us examine the working of this process in short first the conversion of the image has been taken place in re-processing system. It sharpens the edge of the image and filtering of noise and other artifacts in the image has been taken place. It also includes a median filtration for removal of noise as we know in paper salt method in the noise has been removed totally. After this the segmentation process has been taken place where the K-mean and fuzzy algorithm has been implemented to identify the unhealthy cells.
In feature extraction it extracts the clusters which show the tumor at the FCM output. Then those cluster has been given to the Thresholding process where it applies the binary mask over the entire image.
In the approximate reasoning step the tumor area is calculated using the binary method making the dark pixel darker and white brighter. Images are having 2 values black or white (0 or 1) Here 256x256 JPEG image is the highest size of the image as shown in Fig 2. Let us see the flow chart diagram of the proposed system:-

![Figure 2: System flow of proposed system](image_url)
3.1 Pre-Processing System
The main task of pre-processing image is that it translates the image, it completes filtering of noise and other artifacts in the image and sharpening the edges in those image. The RGB to grey conversion and Reshape can be performed over here. It applies a median filter system for noise deduction [1]. For better understanding the function of median filter we added the salt and pepper noise artificially and removing it using median filter. Let us see an image of pre-processing below:-

![Image of pre-processing](image)

Figure 3: Image of pre-processing

3.2 Segmentation Using K-Mean And Fuzzy Algorithm
K-mean clustering:-
It is an iterative technique that is used to partition an image into K clusters. In K-mean clustering, clusters are the collection of objects which are similar in them and are dis-similar to object belonging to other clusters. A clustering could be an organizing object into groups whose members are similar in some kind. K-mean group the object based on attributes in k number of groups where k is mean to be a positive number. The clustering is done by minimizing the Euclidean distance between the data and the corresponding cluster centric. Thus the function of k-means clustering is to group the data.

K-mean Algorithm:-
Step1. Choose the number K of clusters either manually, randomly or based on some heuristic.
Step2. Generate K clusters and determines the cluster’s center.
Step3. Assign each pixel in the image to the cluster that minimizes the variance between the pixel and the cluster center.
Step4. Re-compute cluster centers by averaging all of the pixels in the cluster.
Step5. Repeat steps 3 and 4 until some convergence criterion is met.
Segmentation in 3 and 4 and 5 clusters using this method as shown in fig below:-
Fuzzy C-mean:
The standard FCM is an iterative, unsupervised clustering algorithm. Algorithm of fuzzy c-mean is:
Step1: Choose a number of clusters in a given image.
Step2: Assign randomly to each point coefficients for being in a cluster.
Step3: Repeat until convergence criterion is met.
Step4: Compute the center of each cluster.
Step5: For each point, compute its coefficients of being in the cluster.

3.3 Feature Extraction
The feature extraction is extracting the cluster, which shows the predicted tumor at the FCM (Fuzzy C-means) output. The extracted cluster is given to the threshold process. It applies a binary mask over the entire image. In the approximate reasoning step the tumor area is calculated using the binary method. It makes the dark pixel become darker and white become brighter. Each transform coefficient is compared with a threshold in threshold coding. If it is smaller than the threshold value,
then it is taken as zero. If it is larger than the threshold, it will be taken as one. The threshold process is a comparison where each pixel in ‘f’ is compared to T. Based on which, binary decision is carried out. That defines the value of the particular pixel in an output binary image.

3.4: Approximate Reasoning
In the approximate reasoning step the tumor area is calculated using the binary method. That is the image having only two values either black or white (0 or 1). Here 256x256 JPEG image is a maximum image size. The binary image can be represented as a summation of total number of white and black pixels. This idea has been referred from [2]

There are few steps for the implementation of this system they are as follow:-
Step1:- Usually first user name and password will be checked for authentication. Once the authentication process has been done selection will be made among:- Patient registry, Tumor detection and Testimony.
Step2:- Once the user has been login by their user name and password then they can enter the victims details as their name, age, blood group, address and also the MRI image of the particular patient which has been stored in the database.
Step3:- After registering victim’s details successful message has been displayed on the screen. Now the segmentation part has been taken place in this process image is first segmented by using K-mean and Fuzzy c-mean clustering has been applied on each image.
Step4:- Once the segmentation process has been done it shows the result whether the victim is defected by tumor or not. It also shows the exact location of those unhealthy cells.
Step5:- In testimony process victim’s information has been stored in the database where all the information has been displayed.
Step6:- For new user step 1, 2 has been repeated and gets the new result of those images.

4. Future Enhancement
Future work can be done to improve the application since paper is designed in flexible way. This application is helpful to detect tumor. This can be implemented further to detect various defected cells rather than the given cells. Even though this project fulfills the requirement of the present application there is always scope for future work. According to emerging changes and new versions. In the future we in-corporate new techniques like different ways of detecting the various damage cells using other methods.

5. Conclusion
The tumor can be detect precisely according to the breadth, length and exact position of defected area, by implementing this paper it can help the doctors for analysis of tumor and also the damage to the brain in stage i.e the exact stage of the patient.

References