Percentage of Brain Tumor Calculation using ANN and FCM Techniques

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Abstract:
MRI is the foremost vital procedure, in recognizing the brain tumor. In this paper information mining strategies are utilized for classification of MRI pictures. A unused half breed strategy based on the Manufactured Neural Arrange (ANN) and fluffy c-means for brain tumor classification is proposed. The purposed calculation could be a combination of Counterfeit Neural Organize (ANN) and fluffy c-means, a half breed procedure for forecast of brain tumor. In this calculation, the picture is upgraded utilizing improvement strategies such as differentiate enhancement, and mid-range extend. Twofold thresholding and morphological operations are utilized for cranium striping. Fluffy c-means (FCM) clustering is utilized for the division of the picture to distinguish the suspicious locale in brain MRI picture. Dim level co framework (GLCM) is utilized for extraction of highlight from the brain picture, after which ANN procedure is connected to classify the brain MRI pictures, which give precise and more successfull result for classification of brain MRI pictures.

Key Word: ANN Algorithm, FCM Algorithm.

I. INTRODUCTION

Brain tumor is an unusual development of cells interior the cranium. Tumors can harm the ordinary brain cells by creating aggravation, applying weight on parts of brain and expanding weight inside the cranium. Precise picture division is of at most significance in determination such dangerous, since in the event that not appropriately identified and analyzed, these maladies may result within the death of the individual. Within the past few decades, able to see that the passing due to brain tumor is expanding at a speedier rate. This is often basically due to the inappropriate location and determination. Later studies as well include to this reality. A few strategies are utilized to distinguish brain tumor. These strategies basically transfer on picture handling techniques. Mainly utilized picture division methods are Edge based, locale based and pixel based methods. Edge based strategies like thresholding has certain drawbacks such because it disregards the cells whose edge esteem is drawing nearer the chosen edge. The method of selecting the appropriate edge may be a repetitive assignment done physically and the limit changes from picture to picture. In locale developing strategies, the locale is developed based on homogeneity between the cells of one locale with another. This strategy depends on the determination a seed pixel and may therefore lead to off-base comes about in the event that the introductory seed point isn't chosen accurately. Pixel based clustering is another imperative division method. K-means clustering may be utilized for proficiently clustering tumor cells. But, this strategy is delicate to exceptions and depends on the number of clusters chosen at the starting. Subsequently, clustering methods can be best utilized by combining them with other strategies.

1.1 Attractive reverberation imaging:
Magnetic reverberation imaging, atomic attractive reverberation imaging, or attractive reverberation tomography may be a medical imaging strategy utilized in radiology to imagine inner structures of the body in detail. MRI gives great differentiate between the distinctive delicate tissues of the body, which makes it particularly valuable in imaging the brain, muscles, the heart, and cancers compared with other restorative imaging methods such as computed tomography or X-rays. Attractive reverberation imaging depends upon signals inferred from water particles, which contain between 70% and 80% of the normal human brain. This omnipresent natural particle has two protons, which by ethicalness of their positive charge act as little magnets on a subatomic scale. This causes the cores to deliver a pivoting attractive field distinguishable by the scanner and this data is recorded to develop an picture of the checked region of the body. Attractive field slopes cause cores at distinctive areas to prepare at diverse speeds, which permit spatial data to be recuperated utilizing Fourier investigation of the measured flag. By utilizing angles in several bearings, 2D pictures or 3D volumes can be gotten in any self-assertive introduction. Not at all like CT, which employments X-rays with exceptionally tall recurrence vitality, MRI employments electromagnetic waves within the same parcel of the electromagnetic range as broadcast FM radio. Pictures in MRI require not be obtained trans-axially, and the table or scanner does not move to cover distinctive cuts within the brain. Or maybe, pictures can be gotten in any plane through the head by electronically steering the plane of the filter. Exact spatial localization is accomplished through a prepare named slope encoding. The exchanging on and off of these attractive field slopes are the source of the boisterous clicking and humming commotions that are listened amid an MRI check. Whereas this prepare requires more time than CT checking, imaging can be performed moderately quickly utilizing advanced slope frameworks. Picture concentrated in MRI depends upon a few parameters. These are proton thickness, which is decided by the relative concentration of
water atoms, and T1, T2, and T2* unwinding, which reflect diverse highlights of the nearby environment of person protons. The degree to which these parameters contribute to in general picture escalated is controlled by the application and timing of radiofrequency vitality through diverse beat arrangements.

II. EXISTING SYSTEM

Mainly used image segmentation techniques are Edge based, region based and pixel based techniques. Edge based techniques like thresholding has certain disadvantages such as it ignores the cells whose threshold value is approaching the chosen threshold. The process of selecting the appropriate threshold is a tedious task done manually and the threshold varies from image to image. In region growing techniques, the region is grown based on homogeneity between the cells of one region with another. This method depends on the selection a seed pixel and may therefore lead to wrong results if the initial seed point is not chosen correctly. Pixel based clustering is another important segmentation technique. K-means clustering could be used for efficiently clustering tumor cells. But, this method is sensitive to outliers and depends on the number of clusters chosen at the beginning. Therefore, clustering techniques could be best utilized by combining them with other techniques.

III. DISADVANTAGES

This method depends on the selection a seed pixel and may therefore lead to wrong results if the initial seed point is not chosen correctly. Edge based techniques like thresholding has certain disadvantages such as it ignores the cells whose threshold value is approaching the chosen threshold. The process of selecting the appropriate threshold is a tedious task done manually and the threshold varies from image to image.

IV. PROPOSED SYSTEM

A new hybrid technique based on the Artificial Neural Network (ANN) and fuzzy c-means for brain tumor classification is proposed. The purposed algorithm is a combination of Artificial Neural Network (ANN) and fuzzy c-means, a hybrid technique for prediction of brain tumor. Fuzzy c-means (FCM) clustering is used for the segmentation of the image to detect the suspicious region in brain MRI image. Grey level co matrix (GLCM) is used for extraction of feature from the brain image, after which ANN technique is applied to classify the brain MRI images, which provide accurate and more effective result for classification of brain MRI images.

4.1 PROPOSED SYSTEM ADVANTAGE:
It is provide the accurate and more effective result for both classification and segmentation of brain MRI images. ANN method provide ability to model non-linear dependencies. It is suitable for integrating clinical decision support system for primary screening. Accuracy at minimal executing time. FCM clustering algorithms for the segmentation of MR brain images with intensity in homogeneity corrections and noise robustness is presented.

V. DATA FLOW DIAGRAM

VI. RELATED WORK

1. INPUT IMAGE

The data here requirement is in the form of brain images. We can collect this data from the Secondary sources. It means the images used in existing research. This data will be collected either from the internet or submitting the request to the researchers. Primary data can be collected from the medical or hospitals. The images required with a 512*512 matrix and quantized with 16 bits. They were transferred into the Digital Imaging and Communications in Medicine (DICOM) format.

2. PREPROCESSING

The median filter is normally used to reduce noise in an image. The median filter considers each pixel in the image. It turn and looks at its nearby neighbors to decide whether or not it is representative of its surroundings. The median is calculated by first sorting all the pixel values from the surrounding neighborhood into numerical order. Then replacing the pixel being considered with the middle pixel value. Median filtering is a nonlinear process useful in reducing impulsive or salt-and-
pepper noise. It is also useful in preserving edges in an image while reducing random noise. salt-and pepper noise can occur due to a random bit error in a communication channel. In a median filter, The median intensity value of the pixels within the window becomes the output intensity of the pixel being processed.

3. SEGMENTATION USING FCM
Clustering of data is a method by which large sets of data are grouped into clusters of similar sets of data. Fuzzy c-means (FCM) is a method of clustering which allows one piece of data to belong to two or more clusters. This method is frequently used in pattern recognition.

4. POST PROCESSING
Morphology is a tool of extracting image components. That are useful in the representation and description of region shape, such as boundaries, skeletons, and the convex hull. In morphological operation, there are two fundamental operations such as dilation and erosion. This terms of the union of an image with translated shape called a structuring element. This is a fundamental step in extracting objects from an image for subsequent analysis. The fundamental operations in morphological operations can be listed as erosion and dilation.

Erosion
Erosion is one of the two basic operators in the area of mathematical morphology. It is typically applied to binary images, but there are versions that work on grayscale images. The basic effect of the operator on a binary image is to erode away the boundaries of regions of foreground pixels (i.e. white pixels, typically). Thus areas of foreground pixels shrink in size, and holes within those areas become larger.

Dilation
Dilation is the process that grows or thickens the objects in an image and is known as structuring element Graphically, structuring elements can be represented either by a matrix of 0s and 1s or as a set of foreground pixels.

5. FEATURE EXTRACTION
The image analysis was mainly focuses on the extraction of shape features and their color based segmentation. The image analysis technique is done using Gray-level co-occurrence matrix. The affected areas vary in color and texture and are dominant in classifying disease symptoms. So, we have considered both color and texture features for recognition and classification. Picture texture, explained as a function of the spatial variation in pixel intensities (gray values). The use of color features in the noticeable light spectrum provided additional image characteristic features over traditional gray-scale representation GLCM is a method in which both color and texture features are taken into account to arrive at unique features which represent that image.

- O Energy
- O Entropy
- O Homogeneity
- O Contrast
- O Variance,
- O Correlation

6. CLASSIFICATION USING ANN
Artificial neural networks (ANN) are a group of supervised learning methods that can be applied to classification. The normal ANN classifier takes the set of involvement data and calculates to classify them in one of the only two separate classes. ANN classifier is trained by a given set of training data and a model is willing to classify test data established upon this model. Most habitual classification models are established on the empirical risk minimization principle. ANN implements the structural risk minimization principle which pursues to reduce the training error and a sureness interval term. ANN is popular classification tool used for pattern recognition and other classification purposes.

VII. CONCLUSIONS
The experimental results performed on the different images, it is clear that the analysis for the brain tumor calculation is fast. Then accurate is improve when compared with the manual detection performed by radiologists. Results should be achieved accuracy demonstrating the effectiveness of the proposed method for identifying normal and abnormal tissues from MR image.

VIII. REFERENCES
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