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An Effective Brain Tumor Diagnosis and Monitoring By Spreading Area Measurement

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***Abstract**: Brain tumor cancer is the most common death causing cancer in human being. Finding an effective and single method for both diagnosis and monitoring test still remains a challenging problem in brain tumor detection. This project proposes automated techniques adopted for tumor detection and also for monitoring of patient condition in an efficient manner, by using this method we can extract the abnormality and also do the spreading area detection, analyze the position of abnormality. For increase the accuracy of the automated system we choose hybrid median filtering for preprocessing which is one of the best preprocessing method and segmentation is done by using balanced histogram thresholding and snake method boundary extraction*

1. Introduction

Image is an important source of information. People can know the intension of information through the image processing technology. Digital image processing involves optical systems, micro-electronics technology, computer science, mathematical analysis and other fields. That is a very complex edge science. It is already a comprehensive theoretical system. Its practice is widely used in medicine, military, art, agricultural field. Digital image are used in medical diagnosis also, medical images are best method for the diagnosis of different abnormality in human body.

1.1 Human Brains

The commander of the human nervous system is called brain. The human brain is the largest in size with respect to body ratio when compared to other living beings. It receives signal from the sensory organs and sends commands to the muscles. It weighs about 1.5kg. It consists of 86 billi nerve cells (neurons) and billions of nerve fibres. These neurons are connected by trillions of connections termed as synapses. The human brain Anatomy is given in Figure 1.

A brain tumor or intracranial neoplasm occurs when abnormal cells from within the brain. There are two main types of tumors: malignant or cancerous tumors and benign tumors. Cancerous tumors can be divided into primary tumors that start within the brain, and secondary tumors that have spread from somewhere else, known as brain metastasis tumors. This article deals mainly with tumors that start within the brain. All types of brain tumors may produce symptoms that vary depending on the part of the brain involved.

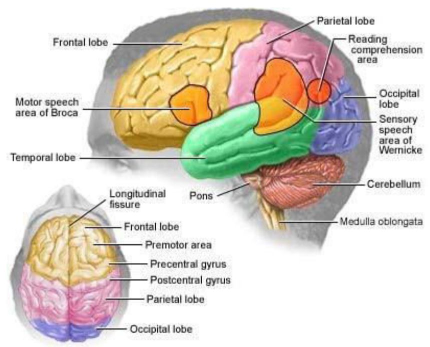

Fig.1 human brain anatomy

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However, recent studies show that white matter architecture is important in processes like learning and memory. The major life threatening disease among human being is brain tumor. According to the recent statistics taken by various cancer research institutes such as National Cancer Institute (NCI), American Brain Tumor Association and Advanced Centre for Treatment Research & Education in Cancer (ACTREC), about 20% of the cancer death is due to brain tumor and it's the leading cause of cancer related death. The accumulation of abnormal cells in the brain forms a mass of tissue which is called as brain tumor. Normally the cells in our body die at a certain period and it is replaced by new cells. When this cycle is disturbed, the old cells don't die and continue to grow. In the meantime the new cells accompany with these old cells and grow along with them and form a mass of tissue known as tumor.

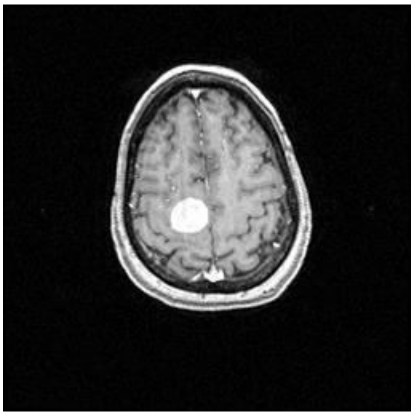


Figure 2.Scanned Image of Brain

The Figure .2 shows a scanned image of brain in which it is affected by tumor. The circular white area in the image is the tumor. Brain tumor can be benign (non cancerous) or malignant (cancerous). The benign brain tumor does not contain cancer cells. It can be removed by surgical methods. It doesn't spread to other parts of the body but it creates a pressure on the sensitive portion of the brain which results in severe health problems benign tumors can become malignant. Malignant brain tumor contains cancer cells. They are more dangerous and are considered to be a big threat to life. They grow rapidly and invade the nearby tissues and other parts of the body. The cancer cells present in the tumor split up and spread to other parts of the body. Physicians divide the brain tumor by grade.

- **Grade I:** The tumor is benign in which the cells look like normal cells and they grow slowly.
- **Grade II:** The tumor is malignant and the cells look less like normal cells but differ from Grade 1 cells.
- **Grade III:** The malignant tumor looks very different from normal cells and Grows actively.
- **Grade IV:** The tumor cells look abnormal and grow rapidly.

The low grade cells can become high grade tumor cells. The change will occur mostly in adults than children.

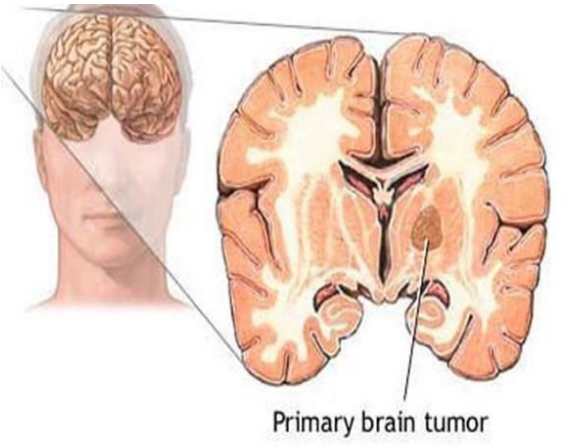


Figure.3 Primary brain tumors

The brain tumor is categorized into primary brain tumor and secondary brain tumor. The Figure 1.3 shows the location of primary brain tumor. Primary brain tumor originates in the brain and secondary brain tumor occurs when the cancer cells from other organs such as lungs or breast spread to the brain. About half of the primary brain tumors are benign. They develop from the brain cells, meninges, nerve cells and glands.

1.2 Monitoring Of Brain Tumor

We have three type of image analysis one is screening, diagnostic and monitoring of patients. Monitoring is the process once brain cancer is diagnosed; many tests are doing after treatment to monitor how well therapies are working. Monitoring tests also may be used to check for any signs of recurrence. Many techniques including computer-aided detection systems and intensity-based methods were introduced for tumor segmentation in brain images. However, no solution is best promising or able to satisfy detection criteria of only including cancerous regions successfully. In the case of brain tumor some radiologist takes manual readings for detection which causes some misdiagnosis due to visual fatigue. Because of that introduce the CAD system for the analysis

2. Literature Survey

Among the subjects suffering from brain tumor, some are likely to be benign and some are malignant. The classification of tumor in terms of grade and type is a tough job for the physicians so far. A lot of researches had been done by many experts in the analysis of MRI images so far which helps the physicians for the prediction of tumor. The noise filtering in images using a Rician model-with particular attention to magnetic resonance imaging-is proposed by Aia Fernandez et al (2008)[1]. A closed-form solution of the linear minimum mean square error (LMMSE) estimator was derived. Additionally, a set of methods that automatically estimate the noise power was introduced. These methods use information of the sample distribution of local statistics of the image, such as the local variance, the local mean, and the local mean square value. The dynamic estimation of noise leads to a recursive version of the LMMSE, which produces a good performance in both noise cleaning and feature preservation.

A class of fourth-order partial differential equations (PDEs) was proposed by You & Kaveh (2000)[2] to optimize the trade-off between noise removal and edge preservation. The time evolution of these PDEs seeks to minimize a cost functional which is an increasing function of the absolute value of the Laplacian of the image intensity function. Since the Laplacian of an image at a pixel is zero if the image is planar in its neighborhood, these PDEs attempt to remove noise and preserve edges by approximating an observed image with a piecewise planar image. Hsieh Wei (1999)[3] introduced generalizations in the Perona-Malik equation and proposed an edge enhancing functional for direct edge Statistical information was utilized for edge stopping. This algorithm was very efficient for edge detection and noise removing pixels in the image.

Protter & Elad (2009)[4] have utilized redundant and sparse representations for removing noise from the given input image. An algorithm named K-SVD was used to train a sparsified dictionary for the images that were corrupted. They generalized the above mentioned algorithm through the following ways (i) number of iterations were reduced for propagating the dictionary from one frame to another or next frame and (ii) patches were averaged in both temporal and spatial neighbouring locations. These mentioned ways were used to have a considerable benefit in complexity and denoising performance. A special technique named support vector regression (SVR) was applied by Dalong Li (2009)[5] in order to remove noise from an image. The support vector values and their weights were computed after the noisy images were trained with a ground-truth. These computed values were used to remove the random noise present in an image at various levels on a pixel-by-pixel basis. This is an example-based approach because it has used SVs for noise removal. Experimental result analysis presented in this article showed that the SVR based denoising method performs better than the Besov ball projection technique on the image that was non-natural in terms of both PSNR and visual inspection.

Lei Zhang et al (2010)[6] had used PCA along with local pixel grouping (LPG) for noise removal. With the aim to preserve the local structures, a vector variable was modeled from a pixel and their nearest neighbour. Their samples for training were elected from the local window through block matching based LPG. This method ensures that only similar content and sample blocks were used for the estimation of PCA transformation. For better performance, LPG-PCA method was iterated.Analysis result given in the paper expressed that the LPG-PCA method Out performs the state-of-the-art noise removal algorithms. Another technique was proposed by Ke Lu et al (2012)[7] for removal of random noise. This method used Nonlocal means algorithm for efficient noise removal and the results of the experiment showed that NL-means based algorithm performed well than the state-of-the-art denoising algorithm.A survey was taken by Preethi & Narmadha (2012)[8], which included some techniques for noise removal as listed,

Quantitative analysis on MRI of brain yields significant performance in noise reduction compared to other quality measures.Similarly, an anisotropic diffusion method for ultrasound images was explained using a novel filtering technique that relies on estimation of the standard deviation of the noise was proposed by Krissian & Aja Fernandez(2009)[11]. The metrics of the filter were chosen automatically from the]estimated noise. This property provided an intuitive filtering by enhancing the convergence rate of the diffusion. The parameters namely planar, volumetric and linear components of the image are combined in this filter.

Yong Yang (2007)[12] proposed a novel fuzzy C-means algorithm named as Penalized fuzzy C-means algorithm. A penalty term is introduced by modifying the objective function of the general FCM. This approach overcomes the noise sensitiveness of the FCM. A high speed parallel fuzzy C-means algorithm was introduced by Murugavalli & Rajamani (2006)[13]. It combines the advantages of both SFCM and PFCM. This algorithm reduces the execution time for large images. diagnosis Decision Tree classification algorithm.V.Vijikala et.al (2016) [20]propose a method for Identification of most preferential de-noising method for mammogram images Mammogram plays a vital role in clinical imaging. It is necessary to provide a clear image to the surgeon for diagnosing the disorder and diseases of soft and complex tissue structure. Images obtained from the mammogram may have noises added to it during capturing of the image. Removing noise is still a challenging problem. Many filters are innovated to remove noise from the image with its postulation, advantage, and limitations. In this paper, Hybrid

Median Filter (HMF), Linear Minimum Mean-Square-Error (LMMSE), Oriented Rician Noise Reduction Anisotropic Diffusion (ORNRAD), Higher Order Hybrid Median (HOHM), and Non-Level Means (NLM) denoising filters are used to remove noise from a mammogram image. The performance analyses of filters were evaluated by Mean Square Error (MSE), Peak Signal to Noise Ratio (PSNR), Image Quality Index (IQI), Mean Absolute Error (MAE), and Contrast to Noise Ratio (CNR) parameters. ORNRAD filter gives desirable results regarding above five quality and performance analysis attributes.

3. Methodologies

3.1 Proposed Methods

Proposed system which is mainly used for monitoring the Brain MRI images of patients when treatment is started, that is for checking present condition of the patient, And also for finding out recurrence of the tumor after treatment. For the analysis we use area measurement of the tumor and find out the changes in area from the previous monitoring and this proposed system can also used for diagnosis purpose .this system which more effective for both diagnosis and monitoring which starts with image acquisition different data set for the processing of brain images. After that preprocessing operation is done get preprocessing operation is done by using a filter known as hybrid median filter which is one of the better filter for MRI images preprocessing after that done the segmentation process segmentation is the process of clustering the image pixel according to the pixel intensity. After that snake or active contour detection method is used for detection of exact tumor that is by using this active contour detection method we can extract exact boundary of the tumor. Some morphological operations are done for feature selection that is morphological dilation and erosion is done for removing unwanted region from the extracted tumor portion then we get actual tumor portion and find out the area of the tumor for growth changes analysis

3.2 Image Acquisition

Image acquisition in image processing can be broadly defined as the action of retrieving an image from some source, usually a hardware-based source, so it can be passed through whatever processes need to occur afterward. Performing image acquisition in image processing is always the first step in the workflow sequence because, without an image, no processing is possible. The image that is acquired is completely unprocessed and is the result of whatever hardware was used to generate it, which can be very important in some fields to have a consistent baseline from which to work. One of the ultimate goals of this process is to have a source of input that operates within such controlled and measured guidelines that the same image can, if necessary, be nearly perfectly reproduced under the same conditions so anomalous factors are easier to locate and eliminate.

3. 3 Denoising Of Brain MRI

The common characteristics of the medical images like as unknown noise, poor image contrast, in homogeneity, weak boundaries and unrelated parts will affect the content of the medical images. This problem rectified by pre-processing techniques. The pre-processing are fundamental steps in the medical image processing to produce better image quality for segmentation and feature extractions. The pre processing steps deal with image enhancement, noise and special mark removal. The image segmentation stages several method existed for automatic and semiautomatic medical image segmentation. The noise, poor image contrast, in homogeneity, weak boundaries and special mark existing in the medical image segmentation process extremely difficult to remove the noise and special markings that exist in medical images. Image filters produce a new image from an original by operating on the pixel values. Filters are used to suppress noise, enhance contrast, find edges, and locate features. If we want to enhance the quality of images, we can use various filtering techniques which are available in image processing. There are various filters which can remove the noise from images and preserve image details and enhance the quality of image. The common noise which contains the image is impulse noise. The impulse noise is salt and pepper noise (image having the random black and white dots). Mean filter not perfect for remove impulse noise. Impulse noise can be removed by order statistics filter. The median filter is the filter removes most of the noise in image. But there is advanced filter called hybrid median filter which preserves corner with removal of impulse noise. There is any type of noise which is added to the input image and image gets degraded. The image degradation should not be there in image processing. For that we have to remove noise in an image as much as possible. In order to remove that we use various types of filters. Impulse noises are classified into two major types: Salt and pepper noise (equal height impulses) impulse values are represented as 0 and 255. Typical noise sources include flecks of dust inside the camera and overheated or faulty CCD elements. Random-valued impulse noise (unequal height impulses) impulse values are between 0 and 255.

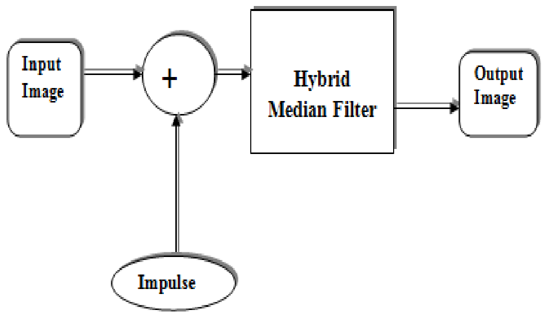
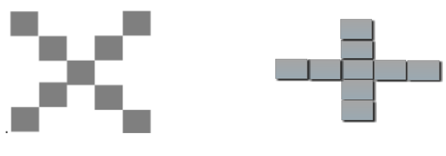


Fig 4. The Block Diagram of Image Restoration Using HMF

Hybrid median filter is windowed filter of nonlinear class that easily removes impulse noise while preserving edges. In comparison with basic version of the median filter hybrid one has better corner preserving characteristics. The basic idea behind filter is for any elements of the signal (image) apply median technique several times varying window

Shape and then take the median of the got median values. The hybrid median filter takes two medians: in an "X" and in a "+" centered on the pixel. The output is the median of these two medians and the original pixel value. Motivation: preserves corners B = hmf (A, n) performs hybrid median filtering of the matrix A using an n x n box. Hybrid median filter preserves edges better than a square kernel (neighbour pixels) median filter because it is a three-step ranking operation: data from different spatial directions are ranked separately. Three median values are calculated: MR is the median of horizontal and vertical R pixels, and MD is the median of diagonal D pixels. The filtered value is the median of the two median values and the central pixel C.



(a)

(b)

Fig.3.4 kernel for hybrid median filter. (a) Pixels at 45^o to the image from edges

(b) Pixels at 90^o to the image from edges

3.4 Segmentation

Image segmentation subdivides an image into its constituent regions or objects. The level to which the subdivision is carried depends on the problem being solved. Segmentation of nontrivial images is one of the most difficult tasks in image processing. Segmentation accuracy determines the eventual success or failure of the computerized analysis procedures. Segmentation algorithms are area oriented instead of pixel-oriented. The result of segmentation is the splitting up of the image into connected areas. Image segmentation is the fundamental step in image analysis, understanding, and interpretation and recognition tasks. Segmentation is the most important step in automated recognition system which has numerous applications in the field of medical imaging, satellite imaging, movement detection, security, surveillance etc. In image processing, the balanced histogram thresholding method (BHT), is a very simple method used for automatic image thresholding. Like Otsu's Method and the Iterative Selection Thresholding Method, this is a histogram based thresholding method. This approach assumes that the image is divided in two main classes: The background and the foreground. The BHT method tries to find the optimum threshold level that divides the histogram in two classes. This method weighs the histogram, checks which of the two sides is heavier, and removes weight from the heavier side until it becomes the lighter. It repeats the same operation until the edges of the weighing scale meet. Given its simplicity, this method is a good choice as a first approach when presenting the subject of automatic image thresholding.

In this use a histogram thresholding equation for the segmentation process as shown below

J(T) = 1 + 2 * (P1 * log(sigma1) + P2 * log(sigma2))- 2 * (P1 * log(P1) + P2 * log(P2))

P1 = sum (histogram1)
P2 = sum (histogram2)
mean1 = sum (histogram1 .* (1:T)') / P1
mean2 = sum (histogram2 .* (1:(256-T))') / P2
sigma1 = sqrt(sum(histogram1 .* (((1:T)' - mean1).^2)) / P1)

sigma2 = sqrt (sum (histogram2.* (((1:(256-T))' - mean2) .^2))/ P2)

First we calculate the two histogram of the image after that find out the sum of pixel values in the image p1 and p2. Then find out the mean and standard deviation of image mean1, mean 2 and sigma1, sigma 2. Using this values create a histogram thresholding function j(t). And using this function image pixels are clustered in to 2 clusters if I >= j(t)   I in cluster 1 other wise in cluster 2.

3.5 Feature Extraction

Features are nothing but observable patterns in the image which gives information about the image. The accuracy of the classification depends on the feature extraction stage. Here, we will calculate texture, statistical and structural features. Feature is used to denote a piece of information which is relevant for solving the computational task related to a certain application. More specifically, features can refer to the result of a general neighborhood operation applied to the image, specific structures in the image itself, ranging from simple structures such as points or edges to more complex structures such as objects. Many features have been extracted for the brain tumor. The extraction methods of texture feature play very important role in detecting abnormalities of brain. Texture features have been proven to be useful in differentiating masses and normal brain. Texture features are able to isolate normal and abnormal lesion with masses and micro calcification. The features that are extracted are as under. Here we used the feature is area of the tumor and exact boundary of the tumor .by using active contour detection or snake method find out exact boundary of tumor.

Active contour model, also called snakes, is a framework in computer vision for delineating an object outline from a possibly noisy 2D image. The snake model is popular in computer vision, and snakes are greatly used in applications like object tracking, shape recognition, segmentation, edge detection and stereo matching. A snake is an energy minimizing, deformable spline influenced by constraint and image forces that pull it towards object contours and internal forces that resist deformation. Snakes may be understood as a special case of the general technique of matching a deformable model to an image by means of energy minimization. In two dimensions, the active shape model represents a discrete version of this approach, taking advantage of the point distribution model to restrict the shape range to an explicit domain learned from a training set.

Snake is a vector valued function in the spatial domain of an image, parametrically expressed as **v** (*s*) = (*x*(*s*),*y*(*s*)) where 0 £ *s* £ 1 . A curve consists of *n* vertices *v* connected by straight lines. The parameter *x* and *y* are the coordinate of the vertices, *v* and are functions of the normalized arc length *s*. The Snake has a dynamic behavior that deforms from an initial position and converges to the boundary of the object in the image. It moves through the domain of the image by minimizing its energy function, which is defined as

$$E_{snake} = E_{internal} + E_{external}$$

Active contour detection accuracy is 98.9

3.6 Feature Selection

The main aim of feature selection (FS) is to identify important features from original feature vector. This is done by removing irrelevant, redundant and noisy features which will be helpful for the best performance in terms of accuracy. Feature selection is a technique to select the features that is relevant for classification stage. The goal of feature selection (FS) is that of reducing the number of features to be considered in the classification stage. This task is performed by removing irrelevant or noisy features from the whole set of the available ones. Feature selection is accomplished by reducing as much as possible the information loss due to the feature set reduction: thus, at list in principle, the selection process should not reduce classification performance. The feature selection process consists of three basic steps a search procedure, a subset evaluation and a stopping criterion. A typical search procedure uses a search strategy for finding the optimal solution, according to a given subset evaluation criterion previously chosen. The search procedure is repeated until a stopping criterion is satisfied. More formal descriptions and examples of how basic morphological operations work are given in the Hypermedia Image Processing Reference (HIPR) developed by Dr. R. Fisher et al. at the Department of Artificial Intelligence in the University of Edinburgh, Scotland, UK.

The erosion of a binary image *f* by a structuring element *s* (denoted $f \ominus s$) produces a new binary image $g = f \ominus s$ with ones in all locations (*x,y*) of a structuring element's origin at which that structuring element *s* fits the input image *f*, i.e. *g(x,y)* = 1 is *s* fits *f* and 0 otherwise, repeating for all pixel coordinates (*x,y*). Erosion with small (e.g. 2×2 - 5×5) square structuring elements shrinks an image by stripping away a layer of pixels from both the inner and outer boundaries of regions. The holes and gaps between different regions become larger, and small details are eliminated

Larger structuring elements have a more pronounced effect, the result of erosion with a large structuring element being similar to the result obtained by iterated erosion using a smaller structuring element of the same shape. If s_1 and s_2 are a pair of structuring elements identical in shape, with s_2 twice the size of s_1, then Erosion removes small-scale details from a binary image but simultaneously reduces the size of regions of interest, too. By subtracting the eroded image from the original image, boundaries of each region can be found: $b = f - (f \ominus s)$ where f is an image of the regions is a 3×3 structuring element, and b is an image of the region boundaries. The dilation of an image f by a structuring element s (denoted $f \oplus s$) produces a new binary image $g = f \oplus s$ with ones in all locations (x,y) of a structuring element's origin at which that structuring element s hits the the input image f, i.e. $g(x,y) = 1$ if s hits f and 0 otherwise, repeating for all pixel coordinates (x,y). Dilation has the opposite effect to erosion -- it adds a layer of pixels to both the inner and outer boundaries of regions.

4. Results and discussion

4.1 preprocessing

We have different filtering methods used for MRI image de noising. we can measure the effectiveness of each filter by consider various parameters like ,peak signal to noise ratio, mean square error, normalized absolute means square error for different noises such as salt and pepper ,Gaussian ,speckle noise and impulse noise . In our analysis we choose PSNR and MSE for measure the efficiency of various filters. Fig.4.1 shows the various filtered images.

4.1.1 PSNR (Peak Signal to Noise Ratio)

PSNR is a ratio between the maximum possible value and the value of corrupting noise of an image which uses to measure the quality of image. Here the value represents the power of image. It was usually expressed regarding logarithmic decibel scales, due to the wide dynamic range of many signals. It was proved that a filter having higher PSNR value is considered to be the best filter.

$$PSNR = 20.\log_{10}\left(\frac{MAX_{IM}}{\sqrt{MSE}}\right)$$

4.1.2 MSE (Mean Square Error)

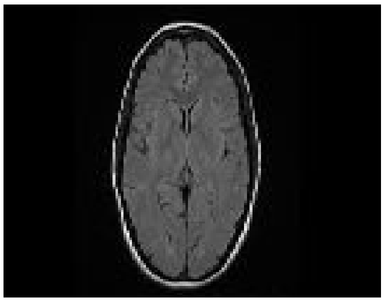
MSE of a filter is one of the ways to evaluate the difference between true value and the value implied by a filter. The difference exists as a consequence of randomness or because the filters may not consider information that could bring about a more veracious estimate. It corresponds to the expected value of square error loss. MSE gauge the average of squares of the error.

MSE could be given as,

$$MSE = \frac{1}{AxB}\sum_{i=1}^{n}\sum_{j=1}^{n}\left(n_{i,j} - m_{i,j}\right)^2 \quad (4.2)$$

Image size given as input is in size A x B, where $n_{i,j}$,$m_{i,j}$ are the initial image and the reconstructed image respectively. From the various image analyses we can find out the performance of the hybrid median filer. Output for the hybrid median filter is as below.

(a)



(b)

Fig .4.1 brain MRI a) Original image b) Hybrid median filtered image

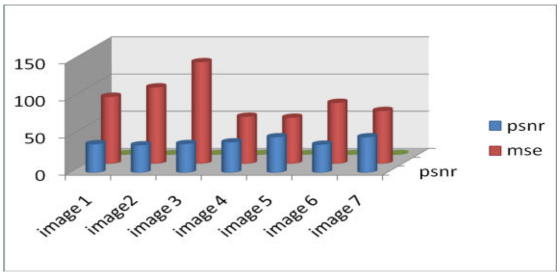


Fig.4.2 Graphical representation of PSNR and MSE

Form above results we can see, the image quality is good for hybrid median filter. The small value of Peak Signal to Noise Ratio (PSNR) means that image is poor Noise Ratio (PSNR) means that image is poor quality. The maximum and minimum PSNR for hybrid median filter is as respectively 45.9923and

37.7432 as shown in graph, which is very high while compare with other filters

4.2 ABNORMALITY DIAGNOSIS

Preprocessed brain MR images are choose for segmentation here we take 3 type of images normal brain image ,brain images with abnormality.

4.2.1 Normal brain MRI

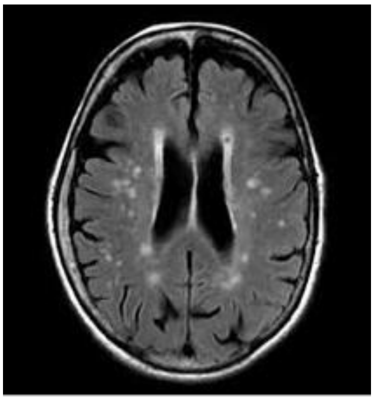


Fig.4.3(a) Normal Brain MRI

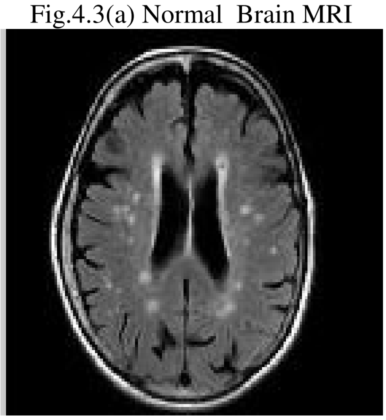


Fig.4.3(b)Preprocessed Image

Fig 4.3(c) Segmented Tumor

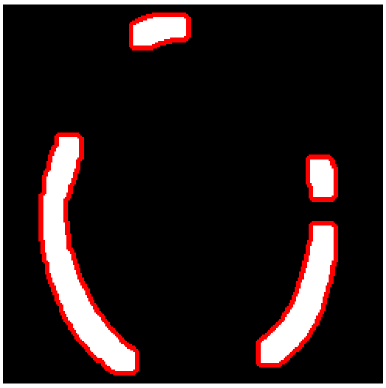


Fig 4.3(d) Active Contour Extraction

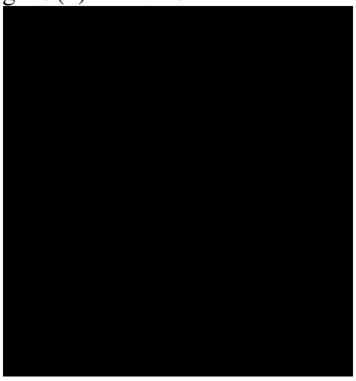


Fig 4.3(e) Selected Feature Of Tumor

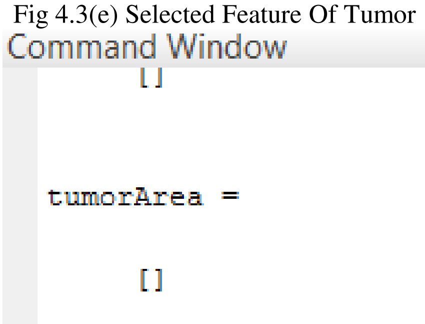


Fig 4.3(g) Detected tumor area

Fig 4.3 Normal brain MRI processing

4.2.2 MRI brain image with tumor

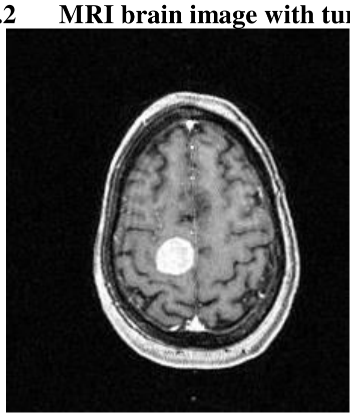


Fig 4.4(a) Input Image

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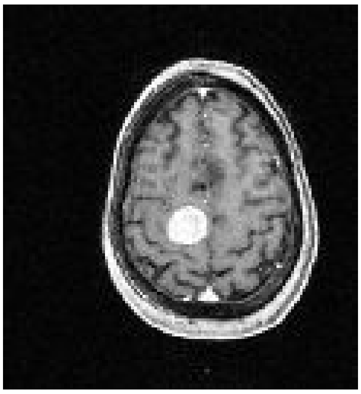

Fig .4.4(b) Hybrid Median Filtered Image

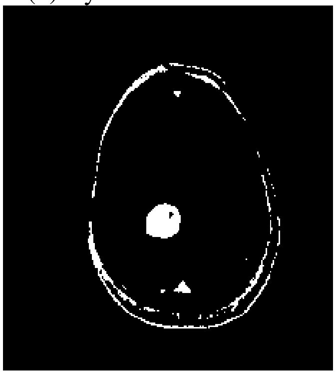

Fig. 4.4(c) Segmented Image

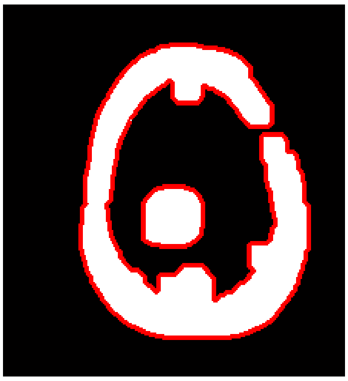

Fig 4.4(d) Feature Extraction process

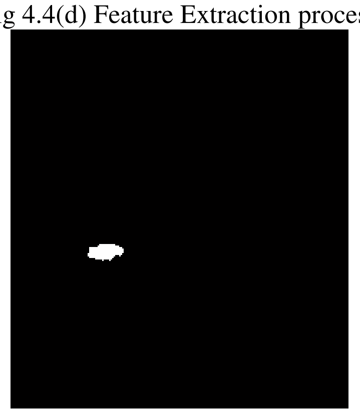

Fig.4.4(e) Selected tumor

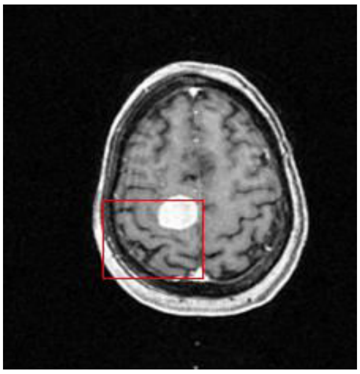

Fig .4.4(f) Position Of The Tumor

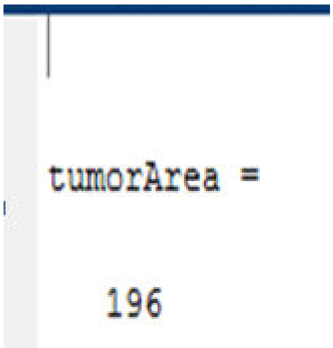

Fig.4.4(g) detected area

Fig 4.4 MRI brain image with tumor

5. CONCLUSION

Accurate brain MRI image processing is the challenging and active research area in the field of medical image processing. Using CAD system can improve efficiency and accuracy of analysis. There is a huge scope for future research to improve the accuracy, precision and speed of processing of brain images for tumor detection. Here we have a CAD system which is mainly for monitoring of patient after treatment and which is also used for diagnosis of abnormalities in the brain in our system we find out exact spreading area of the tumor which provides better treatment assistance to the radiologist. And by considering this spreading area or size of tumor measurement radiologist can analysis the changes of patient condition in monitoring process and also find out the recurrence of the abnormality. In our project we can use MRI images for processing and use hybrid median filtering which is one of the best method for filtering the noises from the input image and segmentation is done by using balanced histogram thresholding and feature is extracted by using active contour detection method which have the contour detection accuracy 98.9%.and all system which have sensitivity 95.55%, and specificity 88.88 %, and have accuracy 93.65%.

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