Brain Tumour Detection in MRI Images Using Matlab

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ABSTRACT

Now a days Medical image processing is the most challenging and emerging field. The image processing is an important aspect of medical science to visualize the different anatomical structure of human body .Magnetic Resonance Imaging (MRI) is one of the significant techniques for examining human body. This paper describes how to detect and extraction of brain tumour from patient's MRI scan images of the brain. Here by using MATLAB software and using the basic concept of image processing, detection and extraction of tumour from MRI scan images of the brain is done.

Keywords : Tumor, Brain, Clustering, MRI image(magnetic image resoning), identifying tumor, Segmentation, GUI (graphical user interface)

I. INTRODUCTION

Brain tumour is one of the most common major causes for the increase in Mortality among children and adults in the world. Tumour is defined as the abnormal growth of the tissues. Brain tumour is an abnormal mass of tissue in which cells grow and multiply uncontrollably. . Many different types of brain tumours exist. Some brain tumours are noncancerous (benign), and some brain tumours are cancerous (malignant).It is estimates that, in children, brain tumours are the cause of one quarter of all cancer deaths. Magnetic Resonance Imaging (MRI) is an advanced medical imaging technique used to produce Brain tumour is one of the most common major causes for the increase in Mortality among children and adults in the world. Tumour is defined as the abnormal growth of the tissues. The National Brain Tumour Foundation (NBTF) for research in United States high quality images of parts contained in the human body. MRI imaging is often when treating brain tumour, ankle and foot. In the brain magnetic resonance imaging (MRI) solidity of tumour is greater than solidity of brain

We can use various methodologies for the classification of MR images, these are fuzzy methods, neural networks, atlas methods, and knowledge based techniques, shaped methods, and variation segmentation.

MRI consists of proton density (PD) and weighted images. The basic steps in image analysis are pre-processing of MRI images, which include image enhancement as well as noise reduction techniques. It is used to enhance the quality of image. After this some morphological methods or operations are applied to detect the tumour in the MRI images. Morphological operations are applied on some assumption such as the size and shape of the tumour and finally mapped onto the original gray scale image.

II. METHODS AND MATERIAL

This is about detecting Brain tumour from MRI images using segmentation program in Matlab with the help of GUI interface Programming. Using the "guide" of Matlab, we can have other methods of image processing running at the same time with image segmentation. Use of Matlab GUIDE (GUI) helps with image segmentation and makes it easy to customize it to all different MRI image characteristics.

The various steps required in this methods are, at first is pre-processing of given image after that segmentation is required and then the morphological operation is perform on the selected MRI images.

The required steps are :

1. Select the MRI image of brain as input.
2. Convert it into gray scale image
3. Take three different sub plots for patient's brain (MRI), tumour alone and detected tumour namely.
4. Implement and run the program.
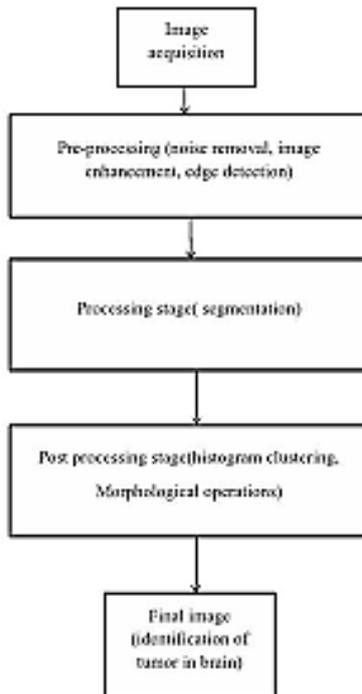5. Final result will be a tumour region

Figure 1. Proposed Block Diagram

Literature Review

The processing of Magnetic Resonance Imaging of images is the most challenging and emerging field.[9][11]The paper contain the segmentation and morphological operation of the MRI images. The methodology mentioned in this paper includes reprocessing of the given MRI images, its segmentation and lastly morphological operation.

Proposed Technology

This is about detecting Brain tumour from MRI images using segmentation program in Matlab with the help of GUI interface Programming. Using the "guide" of Matlab, we can have other methods of image processing running at the same time with image segmentation. Use of Matlab GUIDE (GUI) helps with image segmentation and makes it easy to customize it to all different MRI image characteristics.

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The required steps are:

1. Select the MRI image of brain as input.
2. Convert it into gray scale image
3. Take three different sub plots for patient's brain (MRI), tumour alone and detected tumour namely.
4. Implement and run the program.
5. Final result will be a tumour region.
6. Create a GUI with two push button namely to load image and to detect the brain tumour.

III. RESULTS AND DISCUSSION

Simulation Result

The various steps required in this methods are, at first is pre-processing of given image after that segmentation is required and then the morphological operation is perform on the selected MRI images.

Convert brain image into gray scale

The images obtained from the MRI scan are digital images and are black and white. Images of this type are also called as halftone, which means pure black and pure white. R=G=B(for gray scale image).The darkest possible shade is black and the lightest possible shades is white. Black is represented as R=G=B=0 or R=G=B=00000000. White is represented as R=G=B=255 Or R=G=B=11111111. Grayscale is a range of shades of gray. So due to these reasons it is necessary to convert our MRI images to pre-process in grayscale images.

Need three sub-plots:

There is a need of three different sub-plots to show the output of our project. In first sub-plot we will display the MRI scan image of patient's brain, in second sub-plot only tumour the segemented part of the patient's brain

will be displayed and in third sub-plot the detected tumour along with the patient's brain will be displayed.

Create GUI (Graphical user interface):

Here by writing guide in the command window, it takes us to the GUI and its tool box. With the help of two axes, two push buttons and one static button, we can create a user interface for our project. Here there will be patient's brain MRI images will be load with the help of one push button. On other hand using another push button we can detect the tumour in the patient's brain.

Output of GUI in Our Project
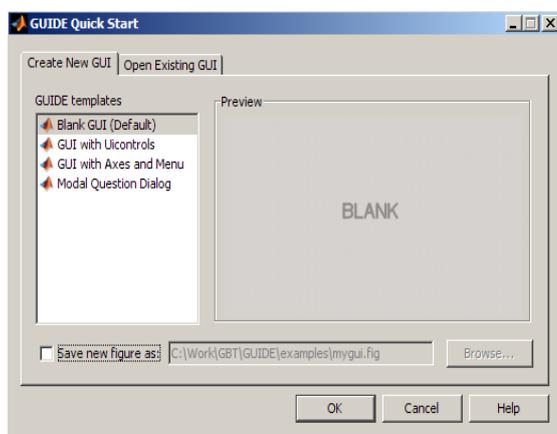
Results of GUI
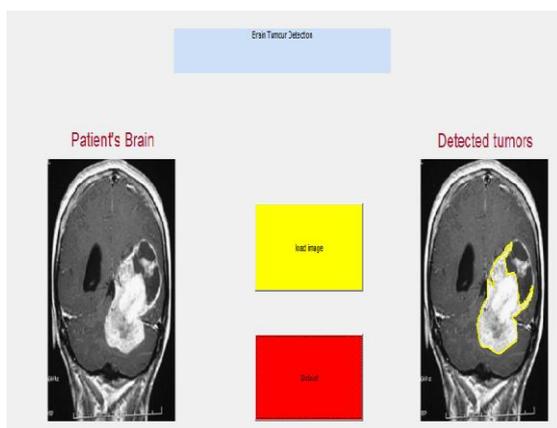
IV. FUTURE WORK

In future this programme can be done more advanced so that tumour can be classified according to its type. Also tumour growth can be analysed by plotting graph which can be obtained by studying sequential images of tumour affected patient. As we know that when we use different test for detection of tumour we go for this, we would to say in future as the programme will more advance so this method should be used for detection of tumour.

V. CONCLUSION

The "BRAIN TUMOUR IDENTIFICATION" has been developed to satisfy all proposed requirements. The system is highly scalable and user friendly. The system minimizes the problem arising in the existing manual system and it eliminates the human errors to zero level. We were able to segment tumour from different brain MR images from our database and are able to detect it is affected by tumor or not without any error factor.

VI. REFERENCES

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