

Brain Tumor Detection Using Image Segmentation

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Abstract- In medical image processing brain tumor detection is a challenging task. Image of brain is difficult to understand. Noise and delay affects the image accuracy. In this technique MRI (magnetic resonance imaging) has become a useful medical diagnostic tool for diagnosis of brain and other medical images. Image segmentation is a major area of medical image processing. The main objective of this paper is to delay using watershed and contrast technique.

Keywords- FPGA, Image Segmentation, Brain Tumor.

I. INTRODUCTION

In this paper we study about how image segmentation plays an important role in medical image analysis. Many segmentation methods have been proposed but none is universally applicable especially for medical images. There are different imaging modalities which includes magnetic resonance imaging (MRI), Ultrasound imaging, computed tomography (CT), X-RAY radiography. It's also maintains the data base of normal persons. Surrounded by all the modalities MRI is considered to the most efficient tool to analyze the internal structures of the body. There are several steps of image processing to be considered to detect the tumor in 2D MRI images. Image denoising and image segmentation are the two process mainly. In this paper image segmentation is used with watershed technique.

The main step followed by image denoising in order to accurately detect the tumor is segmentation. This is the process of identifying a particular workspace. There are several segmentation techniques namely to boggan algorithm, watershed algorithm, visual dictionary algorithm, clustering method, splat feature segmentation, region based algorithm, edge based segmentation, soon. Compared to other methods region based segmentations offer segmented regions they have similar picture intensity. Watershed technique is used, in the study of image processing a watershed of grayscale image is analogous to the nation of catchment basing of a height map. In short a drop of water following the gradient of an image take the path to finally reach a local minimum. The watershed of a relief corresponds to the limits of the adjustment structure basings of the drops of water.

But the problem occurs in watershed segmentation is that its algorithms produce a region for each local minimum. Its normally lead to over segmentation. This algorithm has solved the problem but there remain a scope of further improvement in the segmentation. So there is a need for pre-processing these regions using a new technique so as to improve the existing results. Another way to face this problem is to increase the contrast of the image so as to enhance the affected region. This will help identify the tumor region. In **Fig.1**, it shows the process how its work.



Fig.1 Brain Tumor Detection

II. RELATED WORK

In this paper, Gopal et al [1] proposed a smart system it is designed to diagnose brain tumor through MRI using image processing clustering algorithms such as fluffy C Means along with intelligent optimization tools, such as Genetic Algorithm (GA), and Particle Swarm Optimization (PSO). The average results classification error of GA is 0.078%. The average accuracy GA is 89.6%. PSO gives best classification accuracy and average error rate. In this the Average classification error of PSO is 0.059% and the accuracy is 92.8% and tumor detection is 98.87%. Therefore, we saw that average classification error is reduced when the number of sample is increased. This report has provided substantial evidence that for brain tumor segmentation of PSO algorithm performed well.

In this paper, Badran et al [2], proposed an innovative system which can be used as a second decision for the surgeons and were based on adaptive thresholding. It determines whether an input MRI brain image represents a healthy brain or tumor brain as percentage.it defines the tumor type; malignant or benign tumor.

In this paper, Viji et al [3], uses watershed segmentation technique at the desired parameters, which results the watershed segmentation is the best method to segment a tumor in MATLAB, provided.

In this paper, Aka et al [4], Segmentation and Detection of brain tumor is done using MR images. This method improved the MR image and segments the Tumor Using global thresholding. This method performs well in enhancing, segmenting and extracting the Brain Tumor from MRI images.

In this paper, Dubey et al [5], a relationship of the different semi-automated methods, modified gradient magnitude region growing technique (MGRRGT), level set and a marker controllex watershed method is undertaken here for evaluating their relative performance in the segmentation of tumor. The results show that area measurements obtained using MGMRGT method is in good agreement with manually segmented data.

In this paper, Krishnan et al [6], say about take out brain tumor from MRI brain images using image processing, segmentation, morphological operations and subtraction. Some of the morphological operators that can change the structuring elements of an image as stated to their use are open and close has helped in extracting the tumor from the MRI brain image. The exact shape of the tumor in that MRI image and finally detection of brain tumor in MRI image is achieved.

In this paper, Ghanavati et al [7], it causes to an automatic tumor detection algorithm using multi-modal MRI. The results show 100% detection rate in all our test sets including simulated and patient data with an average accuracy of 90%.

In this paper, Bhattacharjee et al [8], a new technique for brain tumor detection from diseased MR images is developed in it. This would enhance the efficiency of the detection and would stretch it to further disease classification.

In this paper, Yao-Tien Chen [9], a new method proposes an approach integrating 3D Bayesian level set method with volume rendering for brain tumor and tissue segmentation and rendering.

III. CONCLUSION

In this paper we are using Image Segmentation method. We have used a hybrid of two different techniques, i.e. Watershed and Contrast Technique. This technique is well suited for detection of tumor in the image. This segmentation method gives high accuracy as compare to other methods.

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