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A Survey on Brain tumor Detection Techniques

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Abstract - *In recent years, brain tumor is very serious disease which causes death of people. Brain tumor is unwanted mass of tissues inside the brain. Most of the people who have brain tumor die due to inaccurate detection of tumor. In medical field brain tumor detection is very challenging task. Different techniques were developed for detection of brain tumor. Detection of brain tumor is done by feature extraction with the help of pixel intensity. This paper recommends various brain tumor detection techniques that have been proposed to detect the location of tumor inside the brain. These well-known techniques use MRI scanned images for tumor detection purpose. By using MATLAB software we can detect tumor from MRI images of the brain.*

***Key Words*: Magnetic Resonance Imaging (MRI), MATLAB, (Brain Tumor Segmentation) BraTS, Support Vector Machine (SVM), Discrete Wavelet Transform (DWT).**

1. INTRODUCTION

Brain is central part of human body. It is very delicate, spongy and soft part of human body. Brain contains many cells. Every cell has its own function. Cells in brain grow and divide to form another cell to work properly. But many times these growth of cells grows on increasing and lose control over it. It will result in forming a tumor. There are two main types of tumors: Cancerous tumor and benign tumors. Cancerous tumors have again two types one is primary tumor which start within the brain and another type is secondary tumor which spread from somewhere else.

Symptoms of brain tumor depend on several factors, such as tumor type, size, location and extent, as well as age, health history. Some common sign of brain tumor include headache, weakness, numbness, vomiting or seizures. Symptoms of brain tumor are influenced by part of the brain is involved and the functional system it affects. For example, vision problem may result from a tumor near the optic nerve. A tumor in front of the brain may affect the ability to concentrate and think. Any tumor that is significantly large can create multiple symptoms because of the pressure created by the mass.

There are different types of brain tumors according to the National Brain Tumor Society. The primary brain tumors are called gliomas. About one third of all primary brain tumors form from glial cells. By using MATLAB tool detection of brain tumor in earlier stage is possible

2. REVIEW OF LITERATURE

2.1"Automated Brain Tumor Detection and Identification Using Medical Imaging," by N.Abirami, S.Karthik, M. Kanimozhi, IJRCAR, 2015, pp. 85-91

This paper proposed an approach for tumor detection, identification and classification. This paper presents the detection of the brain tumor using segmentation and with help of pixel intensity extraction is done. In this paper proposed system consists of subsequent stages smoothing, non-maximum suppression, and detection of region of interest (ROI) through thresholding. This paper helps to detect the tumor spread position and prevent the spread of the tumor.

2.2 "Detection of Brain Tumor Based On Segmentation Using Region Growing Method" Ms. Tanuja Pandurang Shewale, Dr. Shubhangi B. Patil, IJEIR, 2016, pp. 173–176.

In this paper focus is on detection of brain tumor from efficient Magnetic Resonance images. According to the Researches in developed countries, most of the patient's of brain tumors die due to inaccurate detection. CT scan or MRI that is converted into intracranial cavity produces a complete image to detect the segmentation of brain tumor is also known as region growing method. Region growing method defines the boundaries of brain tumor. The region growing method gives precise segmentation and brain tumor identification. In this paper, during identification process paper & salt noise are added and then filtered out by using median filter. After that seed point is selected and last by using segmentation tumor is located.

2.3 "A Novel Approach for Identifying the Stages of Brain Tumor" by Y.V.Sri Varsha, S.Prayla Shyry in IJCTT, 2014, pp. 92-96.

In this paper neural network is used for identification purpose. This neural network is trained for selected features and after that features are extracted from trained image and tumor can be detected. In this paper image fusion method is used to detect the tumor by using multimodal scanning images. Image Fusion is applied to input. Discrete wavelet transformation is applied to input image to get the coefficient values. A fully automatic procedure for tumor

segmentation is presented in this paper. The method proposed in this paper is based on Discrete Wavelet Transform and neural networks. In algorithm images are integrated firstly and then transform it into new image which leads to an automatic process, in which removing all the noise and reconstructing into a new image. Fusion technique gives relatively good results.

2.4"Image Segmentation and Identification of Brain Tumor from MRI Image" by Sonam S. Gavhande, S.B.Jadhav, IRJET, 2015, pp.167-170

In this paper they describe the strategy to detect & extraction of tumor from patient's Magnetic Resonance images of the brain. This consists of noise removal functions, segmentation and morphological operations which are the basic terms of image processing. They used MATLAB software to detect and extract tumor from MRI scan images of the brain. For this purpose algorithm is used which has two stages, first is preprocessing of MRI Image and second is segmentation of given image. After that perform morphological operations on them. They state that the stage of tumor is based on the area of the tumor. So, for this size of the tumor can be calculated by calculating the number of white pixels in tumor binary image. Brain Tumor can be classified according to its type.

2.5 "BraTS: Brain Tumor Segmentation – Some Contemporary Approaches" by Mahantesh K, Kanyakumari, *IJIRSET*, 2016, pp. 98-103.

In this paper Detection of brain tumor from MRI images involves different steps such as Magnetic Resonance image pre-processing, segmentation of image & feature extraction. This paper describes about the methods that are used Histogram Thresholding, K-means clustering, and Fuzzy C- Means & Support Vector Machine (SVM). In this paper they Presented method includes several steps such as pre-processing; high frequency components and noise are removal & RGB to gray conversion, global image threshold; which converts intensity image into binary image, erosion & dilation of binary image to locate tumor position exactly, detecting the stage of the tumor whether primary Benign or last Malignant.

3. CONCLUSIONS

Papers discussed above provide various methods for detection and identification of brain tumor. This paper presents the concept of brain tumor. This paper gives the overview of different methods that brain tumor can be detected by various techniques as preprocessing, enhancement, segmentation and feature extraction and also different classification algorithms.

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