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A SURVEY ON BRAIN TUMOR DETECTION BASED ON IMAGE PROCESSING TECHNIQUES USING MACHINE LEARNING ALGORITHM

[1]C S Srinivas, [2]M Balasaraswathi

***ABSTRACT**--The development of irregular tissue in a particular place is called a tumor. The human body contains a large volume of cells. The normal procedure is the old cells are replaced by new cells. But in rarely normal function of this procedure is changed due to any unwanted growth of cells. The tumor is identified in an earlier stage by using image processing techniques. It is a very challenging work for current researchers. For detecting a tumor in the brain the MRI images are given as input. In this paper, an important classification and SVM classifier techniques are used to identify the brain tumor in the beginning stages. If the tumor detected in early stages it is mostly curable. The main benefit of this concept is to detect the position of the tumor and easily calculate the size of the tumor.*

***Keywords**--Brain Tumor, Filtering, MRI Image, Segmentation.*

I. INTRODUCTION

In the current scenario Image Processing is one of the interesting areas for every researcher. The image processing concept contains various techniques. These techniques are used in various fields. Image processing techniques applied in the medical discipline also. Image processing concepts are used to identify the affected areas easily. From the past ten years, medical input images are analyzed by using computing techniques. Most of the algorithms produce an accurate result.

Due to this image processing approaches used to detect several diseases in the human body. This research paper is divided into the following 5 divisions. The second section reviews the related works regarding this research. Section three describes the proposed method to detect tumor and section four shows the expected output. Section five describes the conclusion part of the current research work.

II. LITERATURE SURVEY

Khurram Shahzad et al., designs a new algorithm that proposed a new architecture to extract tumor part from the MR pictures. This algorithm contains different phases. In the first phase, filters are used to improve the

[1]*Department of Electronics and Communication,Saveetha School Of Engineering, Chennai, Tamil Nadu, INDIA,callursrinivassharma@gmail.com*

[2]*Asistant professor, Department of Electronics and Communication,Saveetha School Of Engineering, Chennai, Tamil Nadu, INDIA,balasaraswathi.sse@saveetha.com*

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quality of the image. Then morphological operations reapplied to increase the intensity of an image. Next, the threshold rate is applied for binarizing the image. To easily identify the tumor visibility the author applying these all techniques [1].

Vipin Y. Borole et al., identify the tumor location and position various types of image processing techniques are applied. The important techniques are preprocessing approach, filtering, image contrast improvement, edge finding and smoothening function [2].

Samriti, et al., using segmentation technique was used to finding tumor location. In this work, the author combines two various techniques. They are the watershed and contrast approaches. This combined approach gives a more accurate result compared with other methods [3].

Amruta Pramod Hebli, et al., identifies a new gist technique used to find the brain tumor detection easily [4].

Sukanta Kumar Tulo et al., extract various attributes of the brain tumor. These attributes are used to help the medical peoples to calculate the tumor size and location. To implement this concept the author uses MATLAB software. The reports are also generated automatic manner instead of the manual method [5].

MB Bramarambika et al., examines the reason for the brain tumor in human body. He was used a program division technique to identify the tumors in beginning stage. The MR input image is used for processing. Histogram technique was used to identify cell types in the human brain [6].

Rohan K. Gajre et al., introduces the indication of brain tumor. He analyzed various image processing techniques used to identify brain tumor as soon as possible [7].

Shivakumarswamy G.M et al., demonstrate a new method to identify human brain tumor with this position of the particular tumor. The MRI images are used to analyze his method. Initially preprocessing concept is used to identify and delete the noise of an image. Then the noiseless image was segmented by using clustering concept. After that tumor cells and normal cells are divided and the location of the tumor is calculated. Based upon the areas of an identified tumor the stage of the tumor is found out. Then the stage of the particular brain image state forwarded to the patient mobile using GSM concept [8].

Parasuraman Kumar et al., identified the brain tumor by using image processing concept. In his work, he was using various image processing concepts like preprocessing, filtering, segmentation, clustering, and feature extraction. For feature extraction, gray level matrix and classification concept are used. The classifier plays a major part in this work [9].

Khurram Shahzad, et al., designed an algorithm using Gaussian and median filers for identifying tumors in the human body. If the tumor location is identified the remaining part of the existing image is shaded. It is used to easily identify the normal and abnormal part of the brain [10].

III. PROPOSED SYSTEM

The main objective of this proposed work is to detect brain tumors in human beings. Due to this work, the death rate of a human being is going to be reduced and identify the tumor in the earlier stage. In this work, MRI images are used for input. Then the MRI images are pre-processed and enhanced the tumor image by using the K-means clustering concept. After cluster, the technique image extraction is applied. The extracted image was given to the input of the SVM classifier. The SVM classifier is used to identify the tumor is a normal and abnormal stage. The following figure 1 shows the flow diagram of our proposed work.

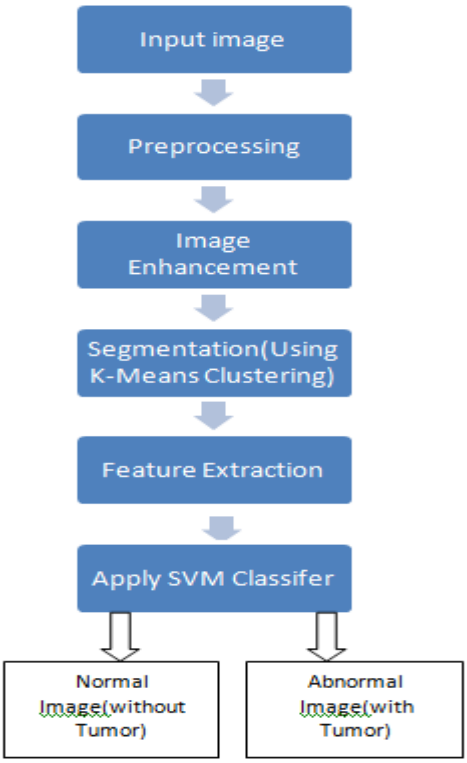

Fig. 1. Flow diagram of proposed work.

IV. RESULTS AND DISCUSSION

Using image enhancement techniques the contrast of the image is increased. The following figure 2 shows the images of reduced and increased contrast levels of the MRI brain image.

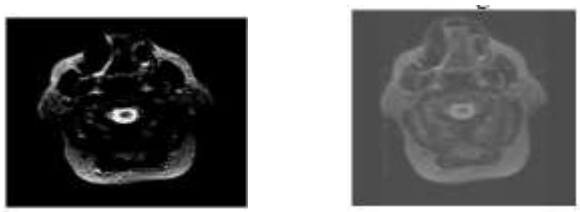

Fig. 2. Increased Contrast and Reduced contrast.

The following figure shows the result images after K-clustering.

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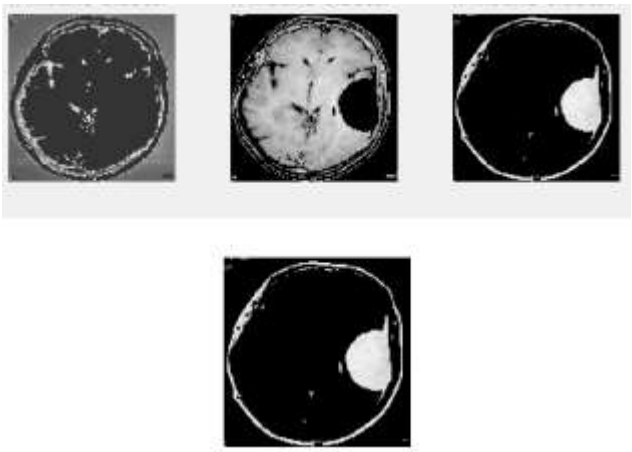

Fig. 3. K-Means clustering result

Figure 4 shows stages of a resulted image after applying the SVM classifier.

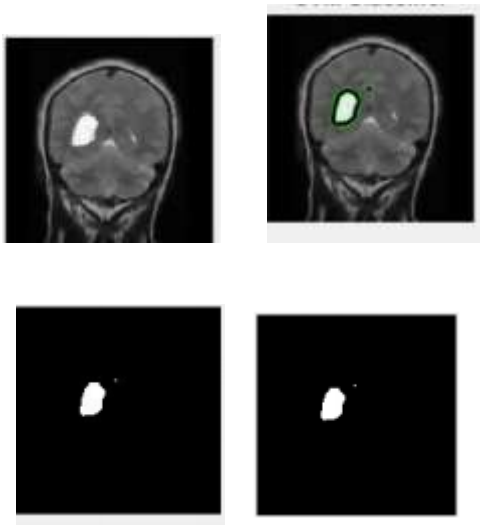

Fig. 4. Segmented tumor

V. CONCLUSION AND FUTURE SCOPE

Identifying brain tumors is a critical task in the medical field. This proposed work used to identify human brain tumors in earlier stage. Here this works using computer-aided system using various image processing and machine learning concepts. The location of this unwanted tissue is identified using the K-Means clustering algorithm. The Support Vector Machine concept is used to easily identify the affected and unaffected area. With noise contents, the image has given to the input of K-Mean clustering technique. The dataset was taken from publically available resources. Feature extractions concept is applied in the resulting image of clustering and finally, SVM techniques are used to find out the status of the tumor. In the earlier stage, it is most probably curable.

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