ADVANCE APPROACH FOR IDENTIFICATION WHITE MATTER FROM BRAIN MRI IMAGES AND CLASSIFICATION

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ABSTRACT

Image processing techniques are widely used in different medical field for improving Detection of disease. Detection is necessary for discover the disease at initial stage and giving a proper treatment for that. Degenerative brain disease is diseases in which nerve cells are deteriorating with time. It affects many of your body's activities, such as balance, talking, movement, breathing and heart function. I t can be a very serious or life-threaten. Most of the diseases have no cure. So detection is very necessary to stop or slow the diseases progress and according to detection proper treatments are given to patients. Treatments may help to relieve pain, and increase mobility. That's why Thresolding with LBP based segmentation algorithm will be develop for segmentation of brain functional elements or regions with Dementia and Alzheimer's diseases into white matter and cortical region which gives atrophy of cortical region and white matter. We will improve the accuracy of the system.

Keyword : - *Tumor, Segmentation, MRI, CT Scan,Classification*

1. INTRODUCTION

Brain tumor segmentation is one of the competitive task to analyse the characteristics of tumor in medical treatment planning. Segmentation of brain tumor is a vital step in the initial detection of tumor in the medical field. Segmentation of brain tumor takes into account the detachment of tumor tissues (tumor, edema and necrosis) from normal brain tissues: gray matter (GM), white matter(WM) and cerebrospinal fluid (CSF)[1].

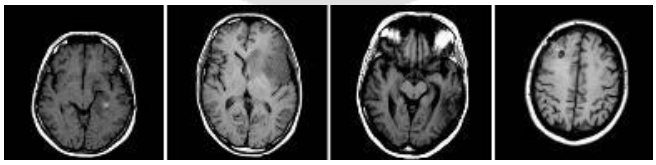


Figure 1 : Brain Tumor image[3]

Brain tumor, is the growth of abnormal cells, which can be either cancerous or non-cancerous. Depending on the type, tumors are classified as Benign Tumor and Malignant Tumor. The earlier stage of detection is necessary in such a way that to prevent the complications of loss of vision and speech which could lead to paralysis and even to death. Currently, in segmenting brain tumor multimodal MRI images are used simultaneously. The radiologist's uses multimodal MRI images because it provides the complementary information regarding on tumor area. Although it

provides immense data regarding tumor area, the segmentation of tumor is defined to be the complicated and difficult task. This is because of their heterogeneity and they are visually vague. The heterogeneity of tumor makes the process tedious, since they have different shapes and sizes which appearing different location. In addition to this, noise in the brain also increases the complexity in segmenting tumor. Therefore automatic brain tumor segmentation is considered in order to provide the acceptable performance [2].

2. TYPES OF TUMOR

The Brain tumor is classified into two main types, namely:

a) Primary tumor:

Primary tumors are those which develop in the brain. The initial growth of the abnormal and the unwanted tissues in the brain is called as the primary tumor. From the brain, the tumor has been spread to various parts of the body. Depending on the concentration the primary tumor are classified in to two types[2].

1) Benign tumor: Benign tumor is a tumor where they are having their boundaries or the edges in which they does not spread over the other parts of the body. Tumor is considerably quite serious if they are meant to be in the vital areas of the brain. On another hand, Tumor can step in to the disability and even it lead to the death [2].

2) Malignant tumor: In malignant tumor are considered to be the most serious one and they develop rapidly. They affect the various vital organs which may leads to the death. About 85% of the malignant tumors are referred to as the gliomas, Gliomas refers to the tumors which have been originated from the gilial cells of the brain [2].

b) Secondary tumor

Secondary brain tumor is a tumor where the tumor in the brain is arisen from the other tumor in the body. They are mainly formed from the cells that have broken away from the primary tumor and have spread in the bloodstream to the brain. The primary source for the secondary tumor is the lung or the blood cancer [2].

3. DIAGNOSE OF BRAIN TUMOR

The various modalities are Neurologic exam, MRI, CT scan, Angiogram, Spinal tap, Biopsy, Biopsy at the same time as treatment, Stereotactic biopsy [8].

- **Neurological Exam**
  The neurological examination is a series of simple questions and tests that provide crucial information about the nervous system. It is an inexpensive, noninvasive way to determine what might be wrong. The neurological examination is divided into several components, each focusing on a different part of the nervous system mental status, cranial nerves, motor system, sensory system, the deep tendon reflexes, coordination and the cerebellum [8].
- **Magnetic Resonance Imaging (MRI)**
  MRI is basically used in the biomedical to detect and visualize finer details in the internal structure of the body. This technique is basically used to detect the differences in the tissues which have a far better technique as compared to computed tomography (CT). So this makes this technique a special one for the brain tumor detection and cancer imaging [8].
- **Computed tomography (CT) scan**
  The CT scan is an x-ray test that produces detailed cross-sectional images of your brain. Instead of taking one picture, like a regular x-ray, a CT scanner takes many pictures. CT scans are not used as often as MRI scans when looking at brain or spinal cord tumors, but they can be useful in some cases. Before the CT scan, you may get an injection of a contrast dye through an IV (intravenous) line. This helps better outline any tumors that are present [8].

4. LITERATURE REVIEW

Title	**Author**	**Methods**	**Remarks**
Automatic Brain Tumor Segmentation in	Malsawm Dawngliana, Daizy Deb, Mousum	Morphology, Multilevel Thresolding	Multilevel thresholding used for segmentation and

MRI:Hybridized Multilevel Thresolding and Level Set [5]	Handique, Sudipta Roy.IEEE(2015)		didn't implement classification for disease
Brain Tumor Segmentation: A Performance Analysis using K-Means, Fuzzy C-Means and Region Growing Algorithm[4].	HeenaHooda, OmPrakashVermaTripti Singhal. IEEE(2014)	K means, fuzzy c-means	Used K-means and fuzzy c-means clustered approach but determining membership function is not easy
Watershed Segmentation Brain Tumor Detection [6]	PadmakantDhage, Prof. M. R. Phegade, Dr. S. K. Shah.IEEE(2015)	Median filter, Bilateral filte	This is tedious and time consuming. Irregular and difficult to assess by clinical examination. Inaccurate.

5. PROPOSED SYSTEM

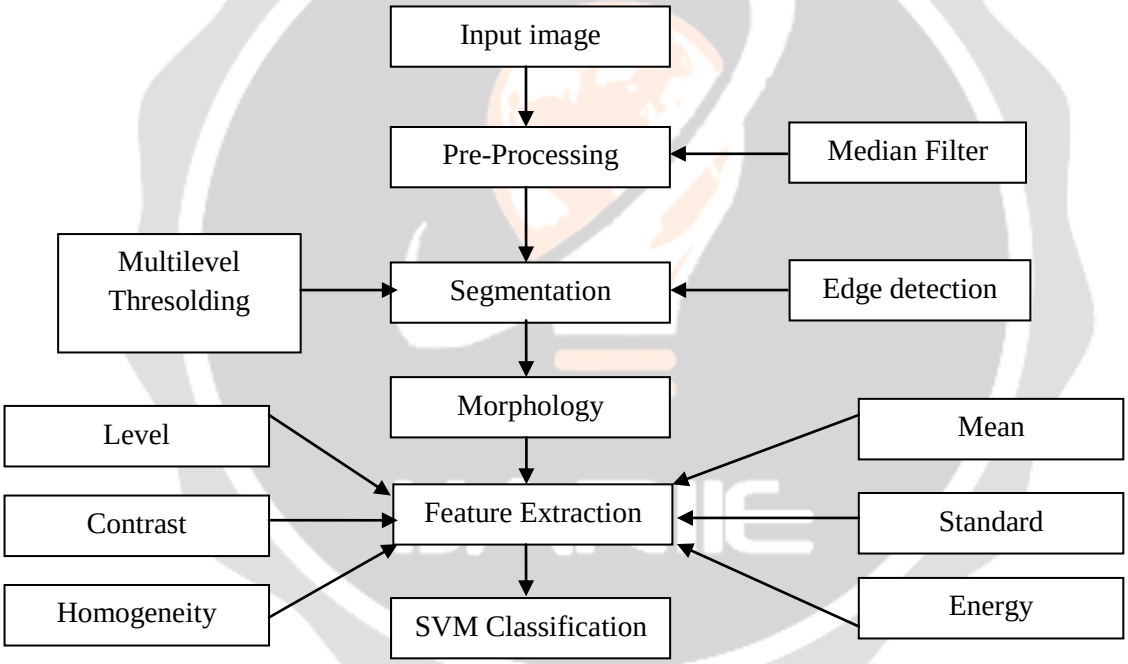
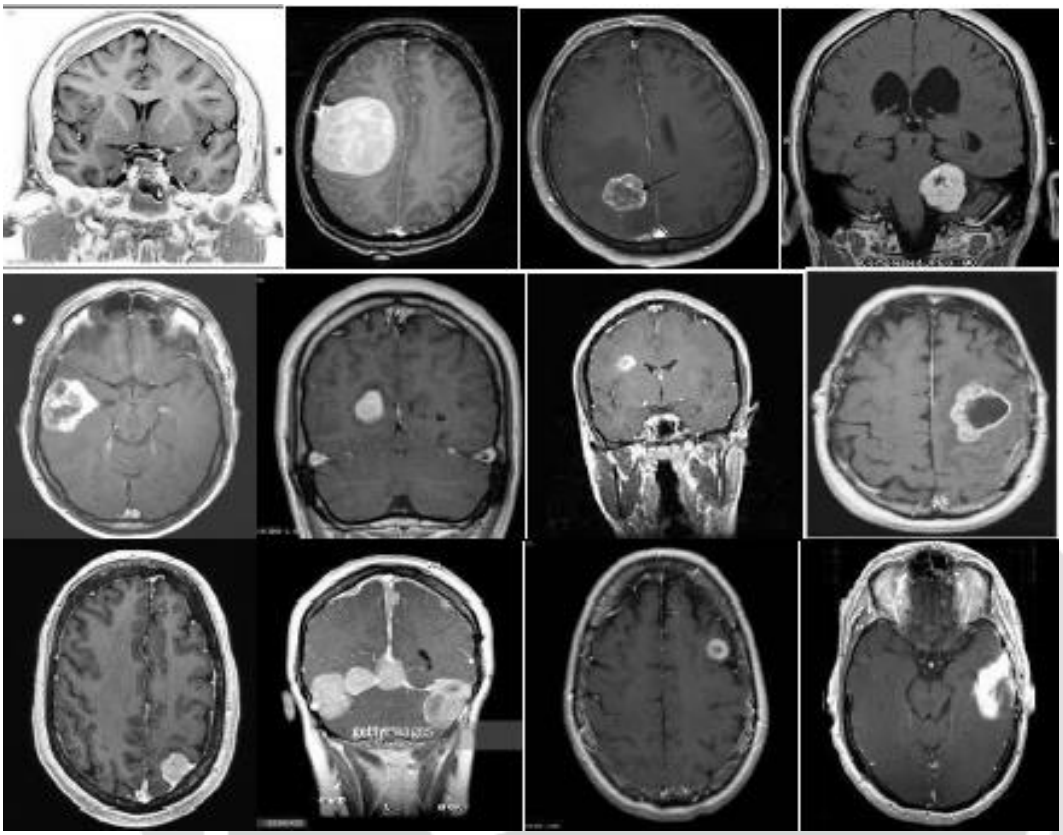


Figure 2: Proposed System

Algorithm

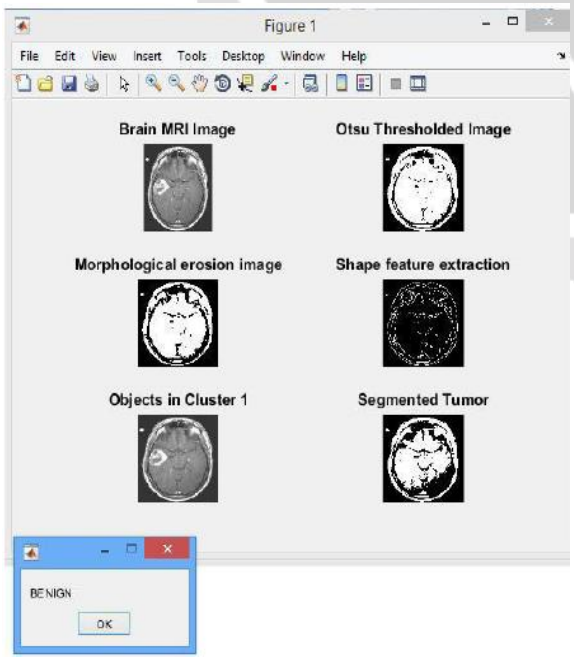
Step 1 : The system starts with MRI Brain images.
Step 2 : Pre-processing :- In this stage,the input image is treated with starting preparing before it goes through any extraordinary reason handling.Here the picture enhances the quality and clamors are evacuated.
Step 3 : Segmentation is a role of block is to subdivide the objects in an image.
Step 4 : The segmented images undergo feature extraction stage where removal of noise is done without destroying the original properties and extract the feature.
Step 5 : SVM classifier to classify the different kind of brain diseases from Brain MRI images on basis of various feature like standard deviation,Mean,energy,Level,Contrast,Homogeneity.

6. DATASET

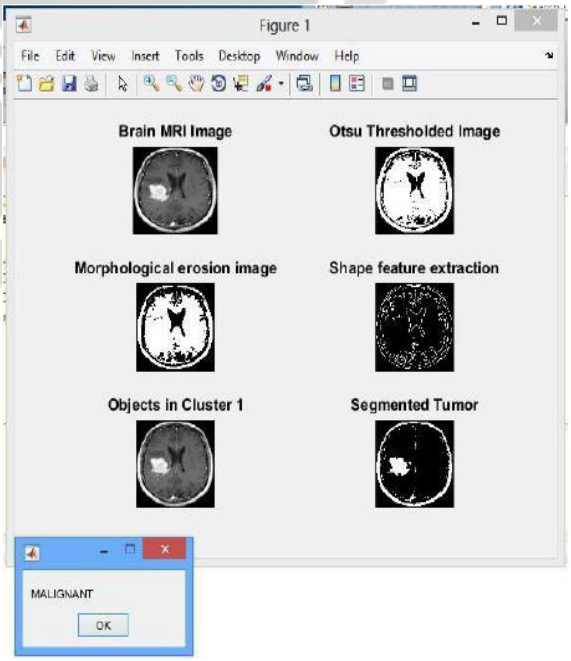


7. RESULTS

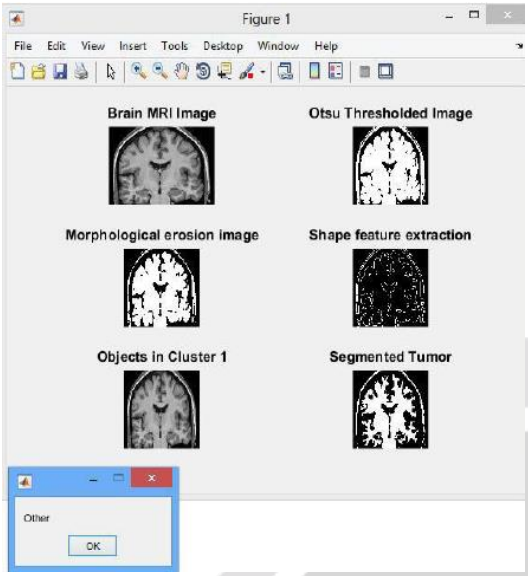
1) Benign

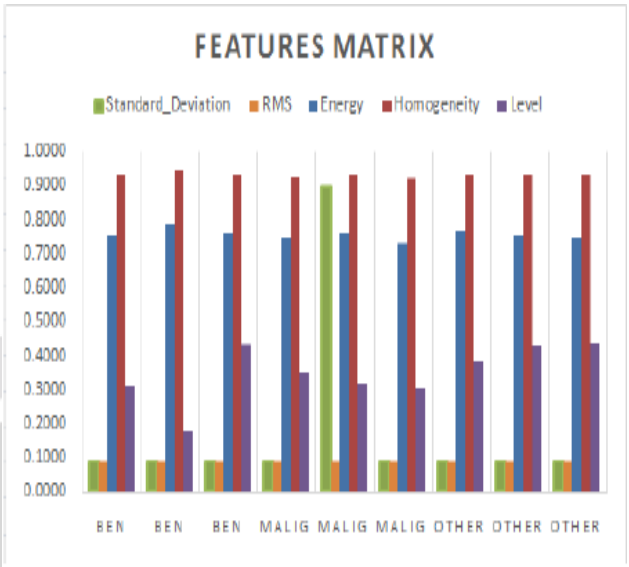


1) Malignant



3) Normal





Here we have shown some of features of Different types of Brain MRI images.

8. CONCLUSION

According to research paper coulded that the result of the present study are of importance in the brain tumor detection methods, Feature Techniques and Classification which is one of the challenging tasks in the medical image processing. This work will be extended for algorithms for brain tumor detection and classification using SVM classifier with high accuracy. We will increase the size of our dataset to support the outcome of our experiment and also classify different diseases and we will also work and classify different types of tumor for normal and abnormal.

9. REFERENCES

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