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BRAMSIT:A Database for Brain Tumor Diagnosis and Detection

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Abstract- MRI is the most frequently used imaging technique to detect brain tumor. The brain is composed of nerve cells and supportive tissues such as glial cells and meninges. A brain tumor is a collection, or mass, of the brain in abnormal cells. Primary brain tumors can be either malignant or benign . A primary brain tumor is a tumor located in the brain tissue. New technologies in supplement to existing imaging modalities improve brain tumor screening. Most brain tumor databases are not publicly available. BRAMSIT is a resource for possible use by the MRI image analysis research community. The projected MRI database is a termed BRAMSIT, characterized by an attempt to offer a group of normal and malignant brain tumor images. The details such as age, and the MRI axial position (i.e., trans-axial, coronal and sagittal) of the patient are interpreted in the database.

Index Terms- Brain tumor, MRI.

I. INTRODUCTION

Brain tumor is a life- threatening disease. Brain tumors can be malignant or benign. When tumor cells grow it cause pressure inside the skull, this leads to brain damage. Two types of Brain tumor namely Primary and secondary. Primary brain tumors are benign and that are originates in brain. Secondary brain tumors occur when cancer cells spread over the brain from other organ such as lung or breast. It is also called as metastatic brain tumor. Brain tumor can be occurred in any ages. If brain tumor detected early stage it is treatable. Brain tumor cause more death in children and adults under the age of 40 than any other cancer. In India the tumors ranges from 5 to 10 per 100,000 populations with an increasing trend.

Medical image processing system used to process MRI images. Image processing converting physical image into equivalent digital image and extract the details from the digital image. Image processing is any form of signal processing in which input as an image like photograph or video and the output may be either an image or a set of characteristics or parameters related to the image. As a result, very suitable differences between abnormal and normal but dense tissue can be made more obvious. BRAMSIT images need to be combined with a regular database of young bud researchers to accurately examine the clinical results of the images.

II. LITERATURE SURVEY

In [1], the authors discussed about the method to produce local volumes of the tumor databases. The authors analyzed numerical and quality parameter of the images using changes in morphological variations. In [2], the authors discussed a new method with a large number of CNNs with the information in overlapping regions. The authors used the OASIS dataset for validation of the results. V.P.Gladis Pushpa Rathi et al[3] proposed a tumor classification method based on feature extraction, features selection, PCA analysis and LDA analysis. The classification accuracy for the proposed method is 98.87%. The authors Amit Kumar Rohit et al.,[4], discussed a single query system based on Content Based Image Retrieval System(CBIR).The proposed system involves preprocessing, feature extraction and detection of tumors. The accuracy of the proposed method is 98.33%. Brats dataset[5] is a dataset used for many researchers for their work. The numbers of images along with their ground truth are . The images consist of normal benign and malignant images. Lot of versions exist in Brats dataset. All the proposed algorithms for tumor detection in various survey papers are normally validated in BRATS dataset only.

III. PROPOSED WORK

The BRAMSIT database is deliberated through subsequent stages:

1) Structure Details along with their axial position
2) Labelling the Images
3) Manual Annotation

A. Structure Details

This dataset involves of 319 MRI scan images collected from various subjects. BRAMSIT consist of 319 images of different subjects. Each subjects includes reference number, age and their axial. The samples of BRAMSIT normal scan images of some subjects are shown in Figure 1. Similarly, the samples MRI abnormal and ground truth images of 5 subjects are shown in Figure 2. The salient features of the database are: • Creation of database along with its clinic statistics for better use of

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images for research. • Abnormal Images with the Ground truth for easy classification. The sample images along with the ground truth images are used for better segmentation and classification. All the ground truth images are developed from the experts opinion.

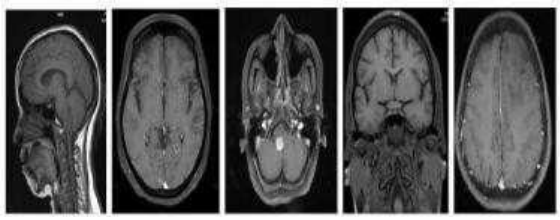

Fig.1 Sample of MRI normal scan images

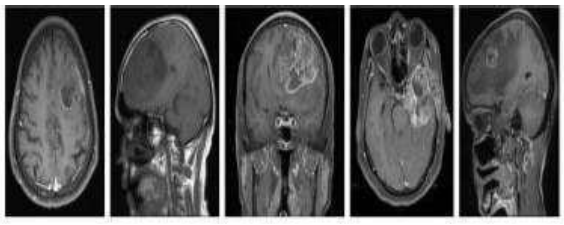

Fig.2 Sample of MRI abnormal scan images

B. Labelling the Images

As said earlier, many databases are there for analysis of brain tumor in MRI imaging modality. As this dataset is also created for the same research outcome when compared with the other databases, one main feature of the proposed dataset is the ease of access and the speed in processing or analysis of the images. When compared with the BRATS dataset, Figshare and Kaggle, the proposed BRAMSIT processing time and accessing time is very less during some bench mark image processing algorithms.

The access time and processing time for the proposed dataset is very less when compared with other datasets.

V. CONCLUSION

The paper describes Screening Brain Tumor for the most recent database. Investigating brain tumor image analysis by using it as a resource. The "abnormal" and "ground truth" images. The main characteristics of this BRAMSIT database are a) 319 MRI images b) Marking the entire subjects biological data. The biomedical research community provides the brain tumor of many uncertain research problems

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In the proposed database all the images are labeled perfectly for the purpose of understanding and interpreting. From the label itself one can easily identify the Subject ID, age and axial position. For example for a image with any abnormality suspect, the images are taken in three planes such as Sagittal ,Transaxial, and coronal View or Transaxial, Coronal and Sagittal View or Coronal ,Sagittal View and Transaxial view. Based on that, some abnormal suspected images are three in number based on their plane. Some normal images are single image with single view. Considering these factors, if Sub1 has three view images then it is labelled as Sub_1_STC, Sub_1_TCS, Sub_1_CST. This indicates subject1's STC means Sagittal, Transaxial, and coronal View, Sub_1_TCS means subject1's Transaxial, Coronal and Sagittal View and Sub_1_CST means subject1's Coronal ,Sagittal View and Transaxial view. In normal cases, the images are labelled as Sub_2_N_TCS, Sub_2_N_STC and Sub_2_N_CST view.

C. Manual Annotation

BRAMSIT provides a detailed analysis of each and every MRI scan image. Each MRI scan images for the following attributes we manually annotated. • Unique ID of the subject- Based on the axial Position • Age • Axial position –Transaxial, Sagittal and Coronal • Gender- Male or Female.

IV. RESULTS AND DISCUSSION

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