CANCER DETECTION USING BIO-MEDICAL IMAGING

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Abstract: **The project entitled Cancer Detection Using Image Processing that Tumor therapies have shown to provide more positive outcomes to cancer patients, Standard standardized propose arisen regarding Tumor Detection Using Image Processing Biomedical Image Processing is a growing and demanding field. It comprises of many different types of imaging methods likes CT scans, X-Ray and MRI .Several simultaneous local feature extraction from modalities Cancer Images, which requires an expertise that is not widespread in clinical practice. Preprocessing, Segmentation, Optimization and Feature Extraction. We implement to find tumors by Training Cancer CT-scan Images. We train CT-Scan images, MRI images from cancer expert doctors then beginner doctors and normal user can use our system .So user can get to know the cancer type its size, symptoms and precaution of particular cancers.**

Keywords**: lung cancer, image processing, artificial network, histogram, Image Processing, Segmentation, Filtering Techniques, Tumor Detection.**

1. INTRODUCTION

Biomedical Image Processing is a growing and demanding field. It comprises of many different types of imaging methods likes CT scans, X-Ray and MRI. These techniques allow us to identify even the smallest abnormalities in the human body. The primary goal of medical imaging is to extract meaningful and accurate information from these images with the least error possible. Out of the various types of medical imaging processes available to us, MRI is the most reliable and safe. It does not involve exposing the body to any sorts of harmful radiation. This MRI can then be processed, and the tumor can be segmented. Tumor Segmentation includes the use of several different techniques. The whole process of detecting brain tumor from an MRI can be classified into four different categories: Pre- Processing, Segmentation, Optimization and Feature Extract.
In Our system different types of cancer is detected such as brain, lung, breast.

Object detection, segmentation, and classification are the key building blocks of a computer vision system for image analysis. The goal of detection and segmentation is to locate and extract meaningful objects from the image. In cytological and histological images, this detection and segmentation play important roles in breast cancer classification between malignant and benign. Same in Brain Tumor developed because of unusual cell growth Within Brain. In same way our System will detect Cancerous cell in Lung also.
In this proposed method, first segment the input images using image processing technique. The feature extracted gives the property of the text character. Feature extraction means to get the information of image in the form of numerical data. Gray Level Co-occurrence Matrix (GLCM) is used for features extraction.

The Cancer detection can be done through MRI image. In image processing and image enhancement tool are used for medical image processing to improve the quality of image. The contrast adjustment and threshold techniques are used for highlighting the features of MRI images. The edge detection, Histogram, segmentation techniques, algorithm to Cancer tumor detection.

The various step of MRI image like: Preprocessing, Feature Extraction, Segmentation, Post-Processing, etc. Which is used for finding the tumor area of MRI-image.

The figure1 shows basic structure of feature extraction through image processing.

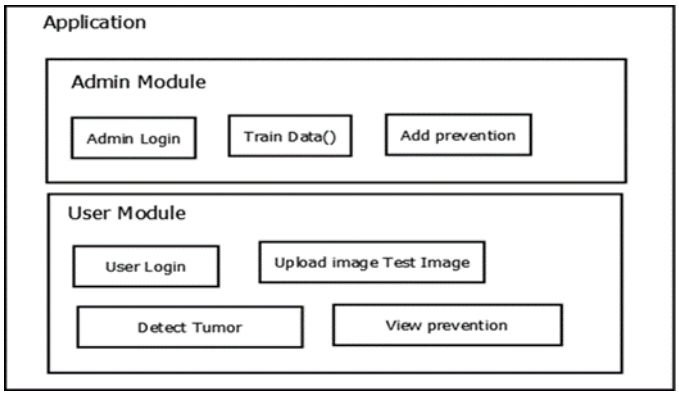

Fig1: Basic Structure of feature extraction

1. Preprocessing:

First step of this technique is to remove noises and enhance the chances of detecting the suspicious region. Enhancement will result in more prominent edges and sharpened image is obtained, noise will be reduced thus reducing the blurring effect from the image

2. Segmentation:

The process of splitting an image into multiple parts is known as segmentation. Its create various sets of pixels within the same image. Segmenting an image makes it easier for us to further analyze and extract meaningful information from it

3. Post-Processing:

In processing segmentation is done using following methods.

- *Threshold segmentation*: Threshold is one of the simplest methods. The input gray scale image is converted into a binary format.
  Some common method used under this segmentation includes maximum entropy method and k-means clustering.

- *Watershed segmentation*: It is one of the best methods to group pixels of an image on the basis of their intensities. It is good segmentation technique for dividing an image to separate a tumor from the image watershed is mathematical morphological operating tool.

4. Feature extraction:

Feature extraction is used to obtain most relevant information from original data by using different techniques. It is used when image size is large and feature representation is needed to complete the tasks quickly.

2. SYSTEM ARCHITECTURE

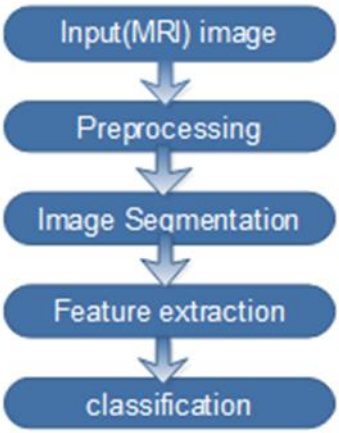

Fig2: System Architecture

In our proposed method we are implementing cancer detecting using images processing, firstly preprocessing on image extracting features from image Extracting effective features for app classification: In this section we first introduce In Training module we are implementing Train Images In this module admin can add CT-Scan Images.

- Admin Module can add prevention for each tumor category.
- Admin Module can add Image category with tumor.
- Input Sample Images: User can input sample images from all cancer images for checking Tumor.

Detection of Tumor category after input images by user system will process and comparing with train dataset images. View Prevention After getting Tumor user can view prevention on tumors.

3. EXPERIMENTAL SETUP

The system is implemented using JDK1.7 with MySQL as a database to store the records and 4GB RAM is used, Netbeans-8.0.1 IDE is used to test the system.

4. APPLICATION

- Use at Medical Colleges for Study Purpose
- Use at Health Care Department
- Use at Hospitals to treat patients.

5. LITERATURE SURVEY

1. A Noble Approach for noise removal from Brain Image using region filling Author: Daizi Deb, Bahnishika Dutta Sudipta Roy Year: 2014
Brain tumor is the main cause of Brain Cancer Tumor can be define as any mass cause by abnormal or uncontrolled growth of cell this mass of tumor grows within the skull, for detecting the brain tumor we use various techniques such as noise, filtering, region interest and region filling

2. A survey on Brain Tumor Detection using image processing techniques Author:Luxit Kapoor, sanjeev Takur
Year: 2017
Bio-Medical image processing is growing and demanding field it comprises of many different type of imaging method like-CT-scan, MRI, X-ray. The primary goal of medical imaging is to extract meaningful and accurate information from these images. with least error possible

3. GLCM and its application in pattern reorganization Author: Shruti singh , divaya shrivastava, suneeta agrawal Year:2017
Gray level Co-Occurrences matrix is one of the technique use to texture analysis. GLCM has two important parameter i.e distance and direction
In this paper we use various technique such as pattern reorganizations and texture analysis

4. Lung Cancer detection using image processing technique Author: Mokhled S. AL-TARAWNNEH
Year : 2012
Recently image processing technique is widely used in several medical areas for improvement in earlier detection and treatment stages time factor is very important to discover the abnormality issues in target image. Gaussians filter and Gabor filter.

6. MATHEMATICAL MODEL

Let S = be a system Cancer Tumor Detection

Where o is successful Tumor Detection

S = {s, e, i, o, f}

Where, s =MRI image

e =Classification

i =MRI Image

o =Tumor Detection

F={f1, f2,f3,f4}

f1 =image processing

f2 =image segmentation

f3 =KNN algorithm

o =classification and detection

Success : When tumor is detected successfully

Failure : When tumor is not detected

Accuracy =(Correctly Predicted Tumor / Total Testing Cases)*100 percent

7. PROBLEM STATEMENT

Previously doctors observe the MRI images and gives the results ,so it will be time consuming also and for beginner doctor they need to consult seniors so it will take time sometime there will be a less accuracy rate also .By the use of proposed system it will be helpful to doctors to detect tumor whether it is cancerous or not and accuracy rate is also increased .Our system will detect which type of cancer it is.Helpful to Doctors, Beginners and Medical students who are studying in respective field.

8. CONCLUSION

This surveys the various techniques that are part of Medical Image Processing and are prominently used in discovering brain tumors from MRI Images. At first the various methods that are being currently used in medical image processing were extensively studied. This involved studying the available research. Based on that research this papers was written listing the various techniques in use. A brief description of each technique is also provided. Also of all the various steps involved in the process of detecting cancer tumor.

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