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Liver Tumour Detection for Ct Images

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***Abstract*—** A cancer is an abnormal growth of cells typically derived from a single abnormal cell. Detection of liver tumour in early stage is important for the prevention of liver tumour. Many techniques have been developed for the detection of liver tumour from CT images. Treatment of any cancer mainly depends on tumour size and grading. Hepatocellular carcinoma is the most common type of liver cancer. Diagnosis involves CT scan of abdomen provides accurate results. Tumour segmentation in liver CT images is a challenging task. This paper deals with the detection of liver tumour from CT images. Implementation of FCM technique and some default tools help to detect the shape of tumour. Finally the tumour part is extracted from CT images and its exact position and shape is determined to calculate the abnormality area

Keywords-*Hepatocellular,ImageProcessing,Computer tomography,Fuzzy C-mean.*

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I. INTRODUCTION

The liver is the largest organ inside the body. Liver cancer is one of the major death factors in the world. Early detection and accurate staging of liver cancer is an important issue in practical radiology [6]. Liver cancer is a chronic cancer which originates in the liver. Liver cancer is the fifth most common cause of cancer death among men and ninth most common death among women [4]. The tumour may be originated elsewhere in the body but latter it migrates towards the liver and makes severe damage to it. The term tumour refers to an abnormal growth. Tumours can be cancerous or non-cancerous. Tumours can be benign or malignant. Benign tumours are not cancer.it do not spread into or nearby tissues.it can be quite large. Once removed it don't grow back. Malignant tumours are cancer. It can spread into or nearby tissues [3]. Tumours will be developed inside the body tissues without any pre-intimation. So the detection and diagnosing of malignant tumour is very important. The manual analysis of the tumour samples is time overwhelming, inaccurate and needs very efficiently trained persons to avoid diagnostic errors. So based on all these parameters into consideration, we propose a computer based approach of detecting these tumours and its stage [5].Treatment of liver cancer can be surgery, chemotherapy and radiation therapy. Selecting the best treatment for liver cancer depends on the physician being able to precisely identify the type, location size and borders of the tumour [2]

II. LITERATURE REVIEW

Ahmed M.Mharib and et al.[2] has presented a review on liver segmentation methods and techniques using CT images, recent methods on liver segmentation are viewed. Liver segmentation methods are divided into two main classes they are semi-automatic and fully automatic. Several methods, approaches, related issues and problems of these of two categories will be defined and explained.

The evaluation measurements of liver segmentations are shown followed by the comparative study for liver segmentation methods, merits and demerits of methods was studied carefully in this paper, they concluded that automatic liver segmentation using CT images was still on open problem since various weakness and drawbacks of the proposed method can still be addressed.

Abdel-massieh et al.[1] presented a fully automatic method to segment the tumours in liver structure. Each slice of segmented liver is subjected to contrast enhancement, and then a white image with some pepper noise and tumours as dark grey spots is added. The image is converted into binary with tumours as black spots on white background using Isodata threshold. For showing the better results the experiment was reported on abdominal datasets

An interactive method for liver tumour segmentation from CT scans is proposed [9]. After image pre-processing, the CT volume is partitioned into a large number of catchment basins using watershed transform .SVM classifier is trained to extract tumours from liver image, while the

corresponding feature vector for training and prediction is computed based upon each small region produced by watershed transform. The method was tested and evaluated on MICCAI 2008. liver tumour segmentation is a challenging task.

The CAD system was proposed by Gletsos Miltiades,et al.[7].It consists of two basic modules: they are ,the feature extraction and the classifier.In their work, region of interest(liver tumour)were identified manually from the CT liver images and then fed to the feature extraction. The total performance of the system has to be calculated. The result contains 97% for validation set and 100% for testing set.
Kumar et al [8] presented an automatic segmentation approach for liver and tumour segmentation from abdominal CT images. The proposed algorithm used thresholding based on analysis of intensity distribution and morphological erosion to simplify the image. The liver is segmented using region growing method. The tumour segmentation from segmented liver is done using FCM clustering. Results are compared to manually segmented results.

III. METHOD AND MODELS

The automated tumour identification system consists of various modules. Each and every step is highly important to ensure the overall high accurate outputs.

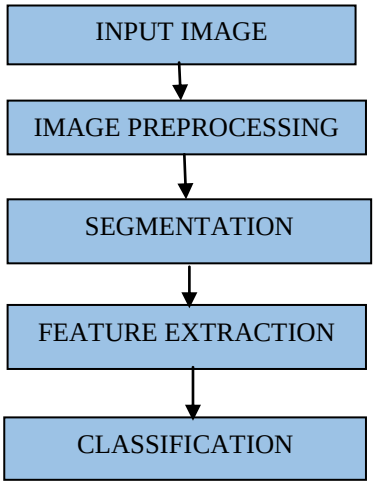

FIG 1: BLOCKDIAGRAM OF LIVER TUMOUR DETECTION.

A .INPUT IMAGE

The input image is the image on which will perform the research using the models in the database. The database images can be CT scan images. This is mainly focused on the liver tumour image which can be used for analysis of liver tumour

FIG 2:INPUT IMAGE

B.PREPROCESSING

Pre-processing is one of the primary steps required for getting accurate segmentation. Pre-processing is nothing but it transforming a source image into a new image which is similar to the source image but differs in certain aspects. e.g. Improved contrast it looks better quality. The main part of pre-processing stage is clutter suppression and image enhancement. For the purpose of normalizing the background throughout the image [3]. The CT image contains different types of noise which reduces the overall accuracy of the images. The pre-processing step converts any given image into grey scale image, and then resize the image. Median filter is applied on it so as to remove the unwanted noise present in an image Image enhancement is the process of enhancing the image to improve the visual quality. Here CLAHE (Contrast Limited Adaptive Histogram Equalization) method is used to enhance the contrast of images by transforming the values in an intensity images so that the histogram of the output image approximately matches a specified histogram

The intensity value of each pixel in the original image is transformed using transfer function to form a contrast-adjusted image

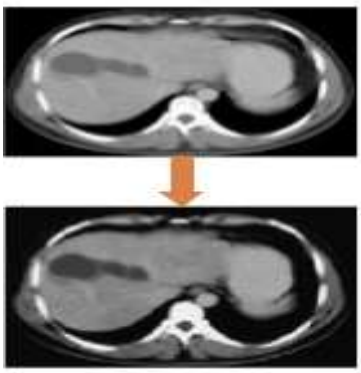

FIG 3:CONTRAST ADJUSTED IMAGE

C .IMAGE SEGMENTATION

Segmentation refers to the process of partitioning a digital image into multiple segments. Image segmentation is

typically used to locate objects and boundaries in images [3]. Segmentation is an essential step before the description, recognition or classification of an image or it's constituent. Every image will have some areas of same parameters like intensity or colour, etc., so basing the similarity in the pixels we identify those areas with same parameters. So that we can have a simpler way to analyse the information from the image. There are many segmentation techniques. Here the FCM Algorithm is used for segmenting the liver tumour from CT images. In FCM each data point belongs to a cluster to some degree that is specified by a membership grade. it provides a method that shows how to group data points that populate some multidimensional space in to a specific number of different clusters. The fuzzy logic is a way to process the data by giving the partial membership value to ach pixel in the image, value ranges from 0 to 1.

Two major approaches for image segmentation are based on the detection of the following characteristics

Discontinuity: Abrupt changes in grey level (corresponding to edges) are detected.

Similarity: Homogeneous parts are detected based on grey-level thresholding, region growing and region splitting.

D ..FEATURE EXTRACTION

It's a special form which is used to reduce the dimension of the images. When the given input is too large to process then this technique is used. The input data will be transformed into a reduced representation set of features. Input data is to be transformed into the set of features is called feature extraction [3]. These reduced features represent the exact information of the input image. Morphology as a tool for extracting image components that are useful in the representation and description of region shape such as boundaries, and convex hull.HOG is used for object detection. Gaussian is used for density analysis.by using these methods the extracted image is used for tumour detection.from the extracted image the parameters has to be evaluated like energy, contrast, entropy and PSNR.

E . CLASSIFICATION

Implementation of FCM techniques are used to detect the tumour area from the segmented liver CT images.FCM techniques are also used for classification of liver tumour.by using these technique to identify the type of cancer.After that performance analysis should take place for calculating PSNR value.

IV. EXPECTED RESULT

The objectives of this paper is to detect the liver tumour in earlier stage so as to reduce the death rate.this paper includes detection and calculation of tumour affected area.the shape and size of the tumour are also be determined which plays a vital role for the treatment of cancer.

V. CONCLUSION

This paper discussed about the automated liver tumour detection for CT images.Many techniques have been developed for detecting the tumour on liver CT images. This paper includes segmentation,detection and calculating the tumour affected area with the help of FCM technique.this technique is used to segment the tumour clearly and gives the shape and size of the tumour.to identify the shape and size of the tumour will help the doctors for give better treatment.finally PSNR and Entropy values are evaluated with the help of segmented tumour.

REFERENCE

[1] Abdel-massieh,N.H.,Hadhoud,M,M.,and Amin, K.M., "Fully automatic liver tumour segmentation from abdominal CT scans," IEEE International Conference on Computer Engineering and Systems(ICCES),pp.197-202,2010

[2] Ahmed M.Mharib,"Survey on liver CT image segmentation methods",Artificial Intelligence Review VOl.37,83-95,Springer 2011

[3] Dr. P. V. Ramaraju, G. Nagaraju,V.D.V.N.S. Prasanth, B. Tripura sankar, P. Krishna, V. Venkat "Feature Based Detection Of Liver Tumour Using K-Means Clustering And Classifying Using Probabilistic Neural Networks" International Journal Of Engineering And Computer Science ISSN:2319-7242 Volume 4 Issue 5 May 2015,

[4] Megha P Arakeri and G Ram Mohana Reddy "Recent Trends and Challenges in CAD of Liver Cancer on CT Images" International Journal of Information Processing.6(1),50-59,2012 ISSN:0973-8215

[5] Ms. P. Geetha,Dr.V.Selvi."An Impression of Cancers and Survey of Techniques in Image Processing for Detecting Various Cancers: A Review". International Research Journal of Engineering and Technology (IRJET).Vol:02 Issue:09|Dec-2015 ISSN:2395-0056

[6] R.Rajagopal P.Subbaiah."A SURVEY ON LIVER TUMOUR DETECTION AND SEGMENTATION METHODS".ARPN Journal of Engineering and Applied Sciences vol.10.NO.6,APPRIL 2015

[7] Seo,K.S."Improved fully Automatic Liver Segmentation using Histogram tail threshold Algorithms" Computational Science ICCS, vol.35,pp.822-825,May 2005

[8] S.S.Kumar,R.S.Moni,and J.Rajeesh, "Automatic Segmentation of Liver and Tumour for CAD of Liver" JOURNAL OF ADVANCES IN INFORMATION TECHNOLOGY,Vol.2 No.1,Feb 2011

[9] Zhang,X.,Tian,J.,Xiang,D.,Li,X.,and Deng,K., "Interactive liver tumour segmentation from CT scans using support vector classification with watershed,"IEEE Conf. Eng Med Biol Soc.,vol.2011,pp.6005-6008,2011