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SEGMENTATION OF LIVER CANCER USING SVM TECHNIQES

M.Rajeshwaran.., A.Ahila,
Dept. of ECE
Infant Jesus College of Engineering and technology
ijcetrajesh@gmail.com

ABSTRACT

Naturally have more spackle noise in Ultrasound liver tumor image. Therefore automatic identification of ultrasound liver tumor image is a challenging task. This paper investigates ultrasound image of liver is detected for normal and abnormal condition by using SVM classifier. SVM is the best method for identification of ultrasound liver cancer tumorin images because preserves spatial information and also it is not affected speckle noise .Here first , we discuss the ultrasonic image segmentation methods and explains the ultrasound image segmentation based on SVM methodology.

Keywords-Segmentation, Support Vector Machine, Ultrasound Liver Cancer Tumor

I. INTRODUCTION

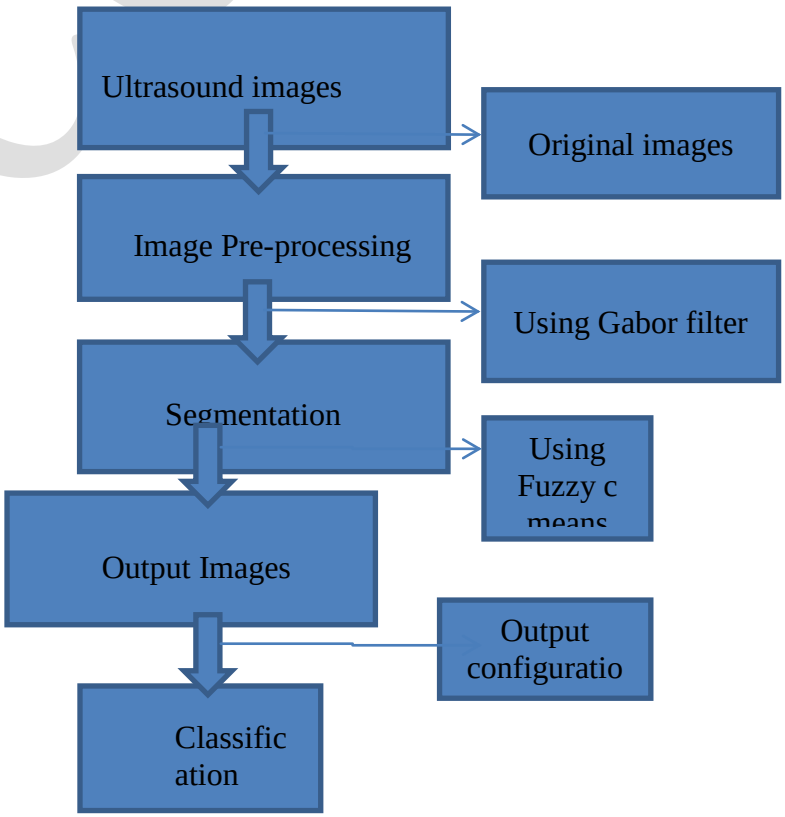
In the medical research Computers are widely used aspect of modern medicine. Liver cancer tumor identify by different techniques such as Ultrasound, Magnetic Resonance Imaging (MRI), Computed Tomography (CT) and Positron Emission Tomography (PET)[1]. Liver is the important parts of the human beings as well as is sixth dangerous diseases in the world is liver cancer tumor. There are two types of liver tumors suchas malignant and benign [2].SVMs can be used to solve various real world problems such as SVMs are helpful in text and hypertext categorization as their application can significantly reduce the need for labeled training instances in both the standard inductive and transductive settings.

Classification of images can also be performed using SVMs. Experimental results show that SVMs achieve significantly higher search accuracy than traditional query refinement schemes after just three to four rounds of relevance feedback.SVMs are also useful in medical science to classify proteins with up to 90% of the compounds classified correctly.Hand-written characters can be recognized using SVM.

II. DETECTION DETAILS

Pre-processing

Poor quality of the ultrasound images and presence of speckle noise leads to over segmentation when watershed segmentation is applied. So in order to get better and meaningfulsegmentation we have to improve the quality of the images. In this study this is done by applying Histogram equalization followed by global filtering. Histogram equalization is well established method to increase the global contrast of image by increasing the range of grey levels in the image[3]. global filtering is very effective method in removing speckle noise and salt-and-pepper noise[4]. The edge pre- serving nature of global filtering makes it suitable for this segmentation problem.



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Segmentation

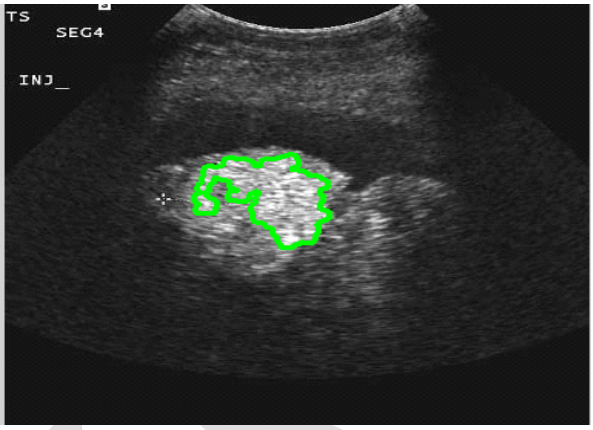
In the image processing, segmentation is played a important role. Ultrasound image Segmentation is very difficult because of poor quality. Segmentation of medical images we will meet three image related problems. Such as, first noisecontain images can alter the intensity of a pixel, Second images exhibit intensity no uniformity, final one is subject to partial volume [5].The main objective of image segmentation is to extract various features of the images which can be merged or split in order to build objects of interest on which analysis and interpretation can be performed. Image segmentation refers to the process of partitioning an image into groups of pixels which are homogeneous with respect to some criterion. The result of segmentation is the splitting up of the image into connected areas. Thus segment is concerned with dividing an image into meaningful regions. The image segmentation techniques such as thresholding, region growing, statistics models, active control modes and clustering have been used for image segmentation because of the complex intensity distribution in medical images, thresholding becomes a difficult task and often fails.In this method using Fuzzy c means algorithm which is used for the segmentation of ultrasound images to increase detection rate.

Classifier

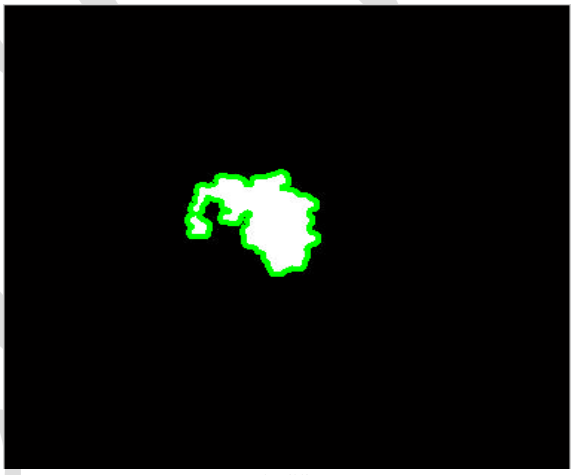
Suppose some given data points each belong to one of two classes, and the goal is to decide which class a new data point will be in. In the case of support vector machines, a data point is viewed as a p-dimensional vector (a list of p numbers), and we want to know whether we can separate such points with a $(p-1)$-dimensional hyper plane. This is called a linear classifier. There are many hyperplanes that might classify the data. One reasonable choice as the best hyperplane is the one that represents the largest separation, or margin, between the two classes. So we choose the hyperplane so that the distance from it to the nearest data point on each side is maximized. If such a hyperplane exists, it is known as the maximum-margin hyperplane and the linear classifier it defines is known as a maximum margin classifier; or equivalently, the perceptron of optimal stability.

III.RESULT & DISCUSSION

The below figures are represent the different stage of liver cancer in human body for example in fig (i),fig(ii) represent the starting stage of tumor in the human body and the image analysis using SVM algorithm.

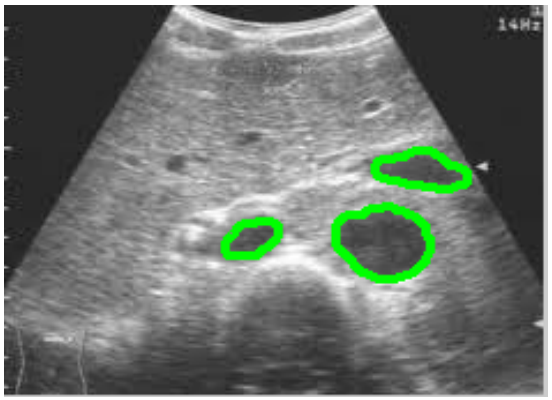


Fig(i)



Fig(ii)

The below fig(iii),fig(iv) represent the tumor affect the whole liver of the human body and we analysis the image using SVM



Fig(iii)

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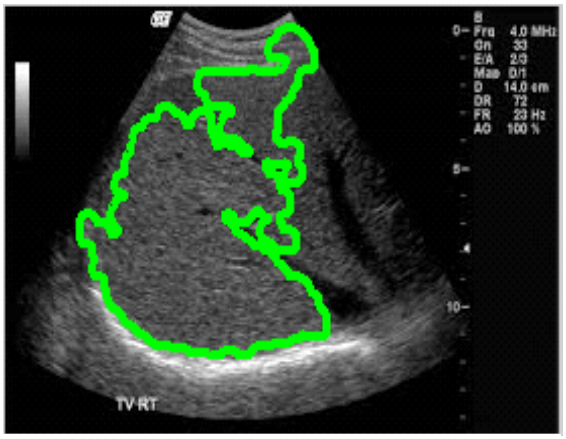

Fig(iv)

IV. CONCLUSION

This paper, we identify the ultrasound liver cancer tumor using SVM classifier and we detect the seed point for the given ultrasound liver image as well as segment the ultrasound liver images and finally we classified the ultrasound liver cancer tumor image as normal, benign and malignant using SVM classifier

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