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RESEARCH ARTICLE



Automatic Segmentation of Digital Images Applied in Cardiac Medical Images

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ABSTRACT: *The digital image processing is important in medical fields. It is used for future operation and study purpose. In that segmentation is the main factors. Image segmentation plays a crucial role in many medical imaging application by automating or facilitating the destination of anatomical structure and author regions of interest that may be used in a specific study. For that purpose there are several methods, but it is difficult to find a method that can easily adapt to different type of images. For that problem ,our paper aims to represents a adaptable segmentation method, and give the better segmentation. To define the threshold this method based on model of automatic multilevel threshholding and techniques of group histogram quantization, histogram analysis percentage of slope and calculation of entropy. This technique rejects the tissue of biopsies from cardiac transplant.*

Keyword: *segmentation,Thresholding,cardiac image*

1. INTRODUCTION

The goal of segmentation is to simplify the images and change the representation of an image into something that is more meaningful and easier to analyze. In biological vision it is very difficult to analysis interpretation and pattern classification, for that purpose many studies are generated with same efficiency in biological system.For this purpose one suitable method is segmentation. In that method firstly analyzed the images and this object is divided into two parts. After that we have to apply the threshold for separate an object. Thresholding recognize

the images and support to separating the images. In many situation threshold does not give the better segmentation for this situation we apply the multilevel Thresholding. For multilevel Thresholding we find the histogram valleys in subdivision of images. This method is good when the image and histogram is well managed. When the images are not well managed they do not give or produced the good result. For that get the group histogram quantization, get the histogram and calculate the maximum entropy for the threshold. After processing the above steps, we get six standardized images without noise and get proper result.

2. METHODOLOGY

It connected with multilevel Thresholding. In threshold method a histogram is computed from all of the pixels in the image and peaks and valleys in the histogram are used to locate the clusters in the images. Segmentation of the histogram is made in particular group. The group size is depending on users.

2.1 Maximum Entropy Algorithm

Histogram Quantization i.e. Divide Histogram into K classes

Optimal threshold for n (=4) levels = [r1 ,r2,r3,r4]

$$\text{Entropy of the Nth class} = H(T) = -\sum_{x=0}^T q(x) \log(q(x))$$

Where $q(i) = \text{prob}(\text{intensity at level } i) / \text{total no of pixels in Respective class}$.

Total entropy(T) = f(r1,r2,r3,r4) = summation of h(j).[final Threshold value]

Image Binarization : - Scan the Original Image → if $p_i < T$ set to 0 intensité if $p_i > T$ set to 255 intensité.

Segment Image. [Output Image] .

3. SYSTEM DESIGN

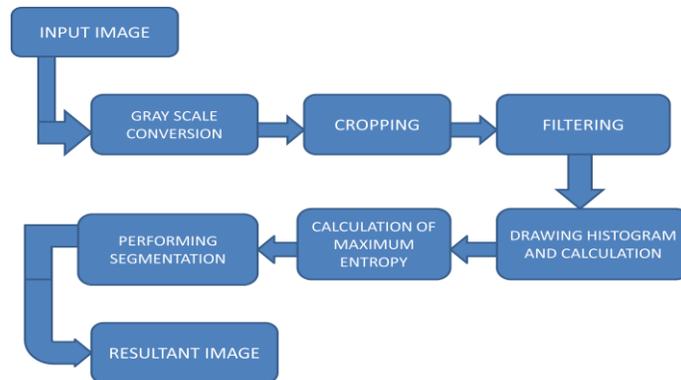


Fig.3.1 System Architecture

- Input Image: The input images are medical images such MRI, CT scan, ECG.
- Gray scale conversion: gray scale has 0-255 range pixels. It will be used in input and output images.

- Cropping:It means remove the unessential part of image or photo.
- Filtering:It is the process of removing noise from image and make image as noise free.
- Drawing histogram and calculation:pixel values frequency distribution is called as histogram.
- Calculation of maximum entropy:threshold image has entropy which tells that maximum transfer information.
- Performing segmentation:It is the process of dividing the image into meaningful parts.
- Resultant Image:All above steps are performing then we get a output image.

4. APPLICATIONS

1)In Medical-Level: Our system identifies cell core, fibrous tissue muscle and tissue. Rejection in biopsies in myocardial images from heart transplant patients.It can be used to locate tumors and other pathologies and Measure tissue volumes.It will also help in Computer-guided surgeries and Diagnosis of disorders.

2)Education-Level :The system can be used to study of anatomical structure of human body.The system can be used to describe fundamental concepts employed in digital imaging.

3)In Research-Level:Our System used in several studies such as medical images and brain tumor recognition analysis.Video image segmentation.Content-based image retrieval.

5. CONCLUSION

By this method we get proper result and possible find the image thresholds. This method identifies to find images thresholds and segmenting them, presenting satisfactory results. It allows the adjustment of parameters such as group size and slope percentages of the histogram. Maximum entropy principle give the good result according to thresholding technique. Our proposed technique give the good result because it creates an adjustment of parameter in the histogram. This technique is dependent on valleys analysis. It is not only based on calculation. Our proposed system identified the diffeacted tissue, muscle and tissue rejection. This application can be used in different medical institutes such as any small scale hospital specialist.

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