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Designing and Analysis of an Efficient and Accurate Approach for Image Segmentation

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Abstract- In computer imagination segmentation of an image alludes to separating a digitalized image in different partitions. The desired of segmentation is to make fresh phase of the depiction of an image into something that is having great significance and free from worry to examine. Objects can be easily identified using segmentation also clarified background in images. More exactly, dealing with segmentation in image we can locate an individual label for each pixel such that the pixels with similar label can share defined visual properties. In this paper context making practice of using adaptive dual threshold median filter with fuzzy c means clustering algorithm and find better result.

Keywords- digital image segmentation; fuzzy c means; adaptive dual threshold median filter etc.

I. INTRODUCTION

One of the major desire of processing an image is to retrieve required information from the given image in a way that it will not effects the other features of that image. Denoising/enhancement of an image is the main step need to gain this necessary condition. After removing noise from an image, you can perform any operation on that image [1].

The systematic investigation over segmentation of images on behalf of many years becomes a high extent of interest. Many of different segmentation procedure are existing in the present time scenario but there is not even one method which can be considered well suitable for different images all procedure are not equally applicable for a specified category of image. Thus, algorithm growth for one class of image may not always be suited to other class of images. Hence there are many demanding issues like development of a uniform proposal to image segmentation which can be applied to all type of images even the selection of a suitable technique for a specified type of image is a difficult issue. Thus in desire of respective decades of investigation there is no globally supported procedure for segmenting an image for all categories of images and thus it becomes a challenge in processing a image and computer wisdom. Based upon various technologies segmentation are recently divided into following classes based on two different aspects of image properties

- Track over condition in intensity

Here an image is separated based on quickly changes in intensity; this comprises image segmentationalgorithms appropriate to edge detection.

- Track on similarities in regions

Here an image is divided into regions that are same kind in according to a set of predefined criterion; this contain image segmentation algorithms like thresholding, region growing, region splitting and merging [2].

The major objective of the work is divided in the following sub-objectives.

- To develop a process for the image partitioning from image decomposition spot of view.
- To develop the mechanism for thresholding action.
- To develop the mechanism for the contour threshold.
- To grow the edge following arrangement

To develop the mechanism for the different color space representation for given color image finally, devise an approach that will give the better experimental output for the color image segmentation and image fusion [3]

II. THRESHOLDING METHOD

Thresholding constructed image segmentation objectsto divide an input image into pixels of two or more values through comparison of pixel values with the already defined threshold value T independently. Failure to find the most appropriate algorithm to determine the threshold value(s) T the result might be one or all of the following

- The segmented area might be smaller or wide range than the image.
- The edges of the segmented area might not be attached
- Terminated or under-segmentation of the image (get up of pseudo edges or missing edges) [4].

III. LITERATURE SURVEY

Avik Banerjee (2016): presents that a method that clusters pixels into four regions based on their intensities. The approach

uses the procedure of thresholding with two local thresholds and one global threshold. The quality of this process remains in the automated generation of three thresholds based on intrinsic characteristics of the image. The global threshold is acquired through neighborhood comparison of localized regions spanning through the image. The global threshold forms two sets of pixels, from which the local thresholds are obtained [5].

Chiranjeev Sagar (2016): presents that A simple and efficient method for the automatic segmentation of clinical images using colorspace analysis and improved binary thresholding algorithm is proposed. Clinical images taken from normal mobile cameras have the inherent problem of improperly illuminated background compared to dermoscopic images. The framework is able to differentiate and extract the cancerous lesion from the background skin with around 94% accuracy with the preferred choice of color channel [6].

Siyu Lu (2016): present that a hybrid method to distinguish normal brain tissue from lesion regions based on the T1-weighted and T2-weighted MR images of the same anatomic structure. Regions of interest were extracted using an iterative Otsu's thresholding method with normal brain tissue extracted from T1-weighted MR images, and lesion regions obtained from T2-weighted MR images. Markov random field and maximum-a-posteriori approaches were used to classify areas dually identified as normal brain tissue in T1-weighted images and lesion regions in T2-weighted images. The approach was validated using synthetic and real MR images to demonstrate its ability to clearly distinguish normal brain tissue from lesion regions [7].

R. R. Gharieb (2016): presents that a method for including local data and membership knowledge into the standard fuzzy C-means (FCM) algorithm. The objective function associated with the technique consists of a modified version of the standard FCM function plus a weighted regularized FCM-like one. In the first function, the Euclidian pixel-to-cluster distances are recomputed using the original data. However, in the second one, they are computed by replacing the original data by locally smoothed one to reduce additive noise. Both distances are also modified to account for the distances in the pixel neighborhood. In both functions, to incorporate the local membership knowledge, the resultant pixel-to-cluster distance is weighted by the reciprocal of the average of the membership to this cluster in the pixel vicinity. Results clustering synthetic and medical images are presented. The performance of the proposed robust local data and membership information FCM (RFCM) is compared with the standard FCM, local spatial information-based FCM (SFCM), and data and local data and membership weighted FCM (LDMWFCM) [8].

Shaoyi Li (2016): present that kernel fuzzy clustering segmentation algorithm based on histogram and spatial constraint, which utilizes the global first-moment histogram of the infrared image to restrict the number of clusters and the clustering center, improves the spatial correlation function that fully manifests the correlations among pixels inside a neighbor domain and reconstructs the membership degree matrix and the clustering central function, thus segmenting the infrared image with the kernel fuzzy clustering algorithm [9].

Jingwei Guo (2016): present that tongue inspection has been one of the four major diagnostic methods in Traditional Chinese Medicine (TCM). The tongue is believed to be able to reflect the health status of the human body. However, making an accurate diagnosis with the tongue is not a trivial task. It usually requires enormous training on the TCM doctor before he can make a reasonable diagnosis. Recently, image processing methods have been put forward to automatically process the tongue images and make diagnosis. This study proposes a k-means clustering and adaptive active contour model based automatic tongue region segmentation algorithm. This study is the first step towards the automatic tongue diagnosis. The method was applied on a set of real tongue images. To quantitatively evaluate the segmentation results, the automatically extracted boundaries were compared to the tongue boundaries drawn by experts. An average coverage ratio of 92% was found, indicating the accuracy of the proposed algorithm [10].

Wu Cao (2016): present that the improved algorithms are then applied in whole heart segmentation of CT sequence images. Experimental results show that: the improved region-based algorithm can avoid leaked segmentation and error segmentation appeared in the segmentation results based on traditional region-growing algorithm, and improved edge-based segmentation algorithm can be applied in the segmentation of images without closed contour, which cannot be segmented through traditional edge-based algorithm. Besides, these two improved segmentation algorithms proposed in this paper have significant effect on cardiac location, cardiac surgical navigation, interventional treatment, and computer-aided diagnosis applications and so on [11].

IV. PROPOSED METHODOLOGY

To overcome with the base method's drawbacks we are trying to design a new optimizes hybrid technique so that we can clearly identify the object or can segment the object from the background in such a way so the object can be identified easily. To do so we will use an Adaptive dual threshold median filter and fuzzy c means clustering algorithm. The proposed technique is based on the results.

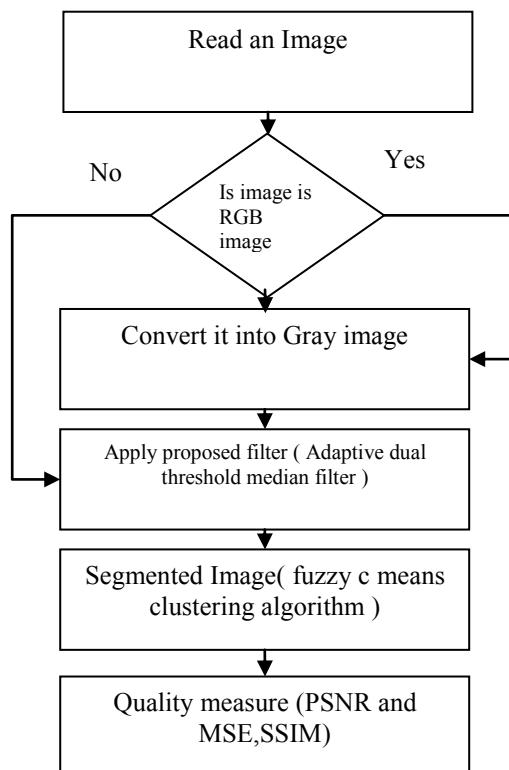


Figure 1. Proposed algorithm

V. RESULT ANALYSIS

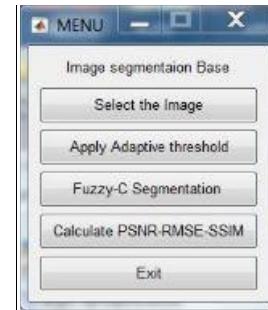


Figure 2. Image segmentation menu

Image segmentation menu which contain various steps which is perform in our proposed work

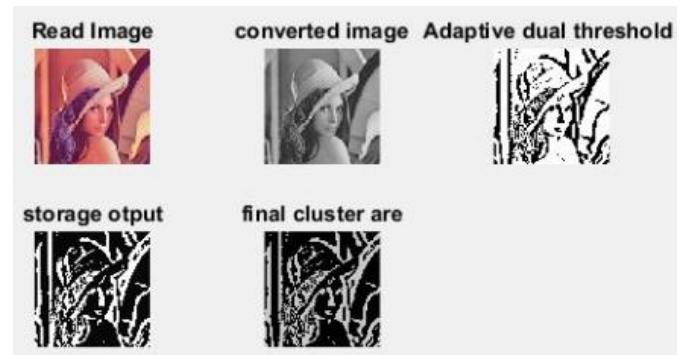


Figure 3. Result on Lena image

In this figure show various function on Lena image

Table 1- PSNR comparison base and proposed

Image	Base PSNR	Proposed PSNR
Lena.jpg	22.137	33.31
Host.jpg	21.5621	34.10
Onion.png	21.776	29.78
Pears.png	22.3681	29.33
Cameraman. tiff	21.944	30.32

On various image PSNR comparison base and proposed technique and then find various result.

Table 2- MSE comparison base and proposed

Image	Base MSE	Proposed MSE
Lena.jpg	397.351	30.378
Host.jpg	453.8112	25.31
Onion.png	437.99	68.44
Pears.png	376.98	75.95
Cameraman. tiff	415.59	60.381

On various image MSE comparison base and proposed technique and then find various result.

VI. CONCLUSION

Segmentation refers to a low level operation deal with partitioning of images by detecting similarity or discontinuity, or equivalently, by finding edges or boundaries'. Segmentation is the procedure for partitioning an image into various partitions, so as to manipulate the optimization of an image into something which is more meaningful and easier to analyze.

In this paper using Adaptive dual threshold median filter with fuzzy c means clustering algorithm and find better result.

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Table 3- SSIM comparison base and proposed

Image	Base SSIM	Proposed SSIM
Lena.jpg	0.8756	0.9937
Host.jpg	0.8248	0.989
Onion.png	0.8728	0.9757
Pears.png	0.814	0.979
Cameraman.tif	0.578	0.965

On various image SSIM comparison base and proposed technique and then find various result.

