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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; aptive 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.De-noising/enhancement of an image is the main step need to gain this necessary condition.After removing noise from an image, you can performany 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 method which can be considered well suitablefor 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 theselection of asuitable technique for a specified type of image is adifficult 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 aresame kind in according to a set of predefined criterion;this contain image segmentation algorithms likethresholding, region growing, region splitting andmerging [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 imagefinally, devise an approach that will gave 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 morevalues through comparison of pixel values with thealready defined threshold value T independently. Failure to findthe most appropriate algorithm to determine the thresholdvalue(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 thatclusters pixels into four regions based on their intensities. Theapproach

uses the procedure of thresholding with two localthresholds and one global threshold. The quality of thisprocess remains in the automated generation of three thresholdsbased on intrinsic characteristics of the image. The globalthreshold is acquired through neighborhood comparison oflocalized regions spanning through the image. The globalthreshold forms two sets of pixels, from which the localthresholds are obtained [5].

ChiranjeevSagar (2016): presents that A simple andefficient method for the automatie segmentation of c1inicalimages using colorspace analysis and improved binarythresholding algorithm is proposed. C1inical images takenfrom normal mobile cameras have the inherent problem ofimproperly iIlumined background compared to dermoscopicimages. The framework is able to differentiate andextract the cancerous lesion from the background skin witharound 94% accuracy with the preferred choice of colorchannel [6].

Siyu Lu (2016): present that a hybrid method todistinguish normal brain tissue from lesion regions based on theT1-weighted and T2-weighted MR images of the same anatomicstructure. Regions of interest were extracted using an iterativeOtsu's thresholding method with normal brain tissue extractedfrom T1-weight MR images, and lesion regions obtain fromT2-weight MR images. Markov random field and maximum-aposterioriapproaches were used to classify areas dually identifiedas normal brain tissue in T1-weighted images and lesion regionsin T2-weight images. The approach was validated usingsynthetic and real MR images to demonstrate its ability to clearlydistinguish normal brain tissue from lesion regions [7].

R. R. Gharieb (2016): presents that a method for includinglocal data and membership knowledge into the standard fuzzyC-means (FCM) algorithm. The objective function associatedwith the technique consists of a modified version of the standardFCM function plus a weighted regularized FCM-like one. In thefirst function, the Euclidian pixel-to-c1uster distances arecomputed using the original data. However, in the second one,they are computed by replacing the original data by locallysmoothed one to reduce additive noise. Both distances are alsomodified to account for the distances in the pixel neighborhood.In both functions, to incorporate the local membership knowledge, the resultant pixel-to-c1uster distance is weightedby the reciprocal of the average of the membership to this clusterin the pixel vicinity. Results c1ustering synthetic and medicalimages are presented. The performance of the proposed robustlocal data and membership information FCM (RFCM) iscompared with the standard FCM, local spatial informationbased FCM (SFCM), and data and local data and membershipweighted FCM (LDMWFCM) [8].

Shaoyi Li (2016): present that kernel fuzzy clustering segmentation algorithm based on histogram andspatial constraint, which utilizes the global first-momenthistogram of the infrared image to restrict the number of clustersand the clustering center, improves the spatial correlationfunction that fully manifests the correlations among pixels insidea neighbor domain and reconstructs the membership degreematrix and the clustering central function, thus segmenting theinfrared image with the kernel fuzzy clustering algorithm[9].

JingweiGuo (2016): present that tongue inspection has beenone of the four major diagnostic methods in Traditional ChineseMedicine (TCM). The tongue is believed to be able to reflect thehealth status of the human body. However, making an accuratediagnose with the tongue is not a trivial task. It usually requiresenormous training on the TCM doctor before he can make areasonable diagnosis. Recently, image processing methods havebeen put forward to automatically process the tongue images andmake diagnosis. This study proposes a k-means clustering andadaptive active contour model based automatic tongue regionsegmentation algorithm. This study is the first step towards theautomatic tongue diagnosis. The method was applied on a set ofreal tongue images. To quantitatively evaluate the segmentationresults, the automatically extracted boundaries were comparedto the tongue boundaries drawn by experts. An average coverageratio of 92% was found, indicating the accuracy of the proposedalgorithm [10].

Wu Cao (2016): present that the improved algorithms are thenapplied in whole heart segmentation of CT sequence images.Experimental results show that: the improved region-basedalgorithm can avoid leaked segmentation and error segmentationappeared in the segmentation results based on traditional regiongrowing algorithm, and improved edge-based segmentationalgorithm can be applied in the segmentation of images withoutclosed contour, which cannot be segmented through traditional edgebasedalgorithm. Besides, these two improved segmentationalgorithms proposed in this paper have significant effect oncardiac location, cardiac surgical navigation, interventionaltreatment, 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.

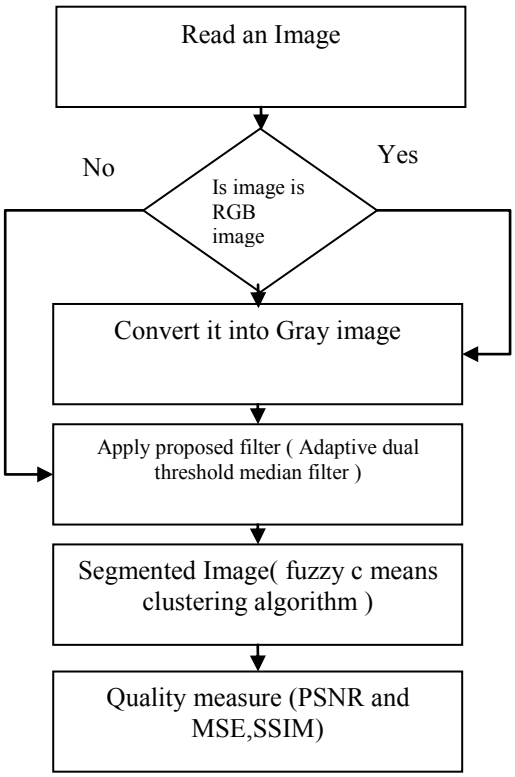


Figure 1. Proposed algorithm

V. RESULT ANALYSIS

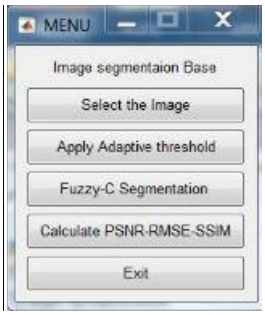


Figure 2. Image segmentation menu

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

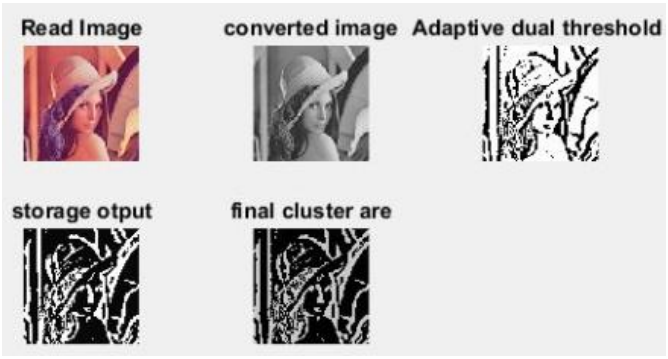


Figure 3. Result on Lena image

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

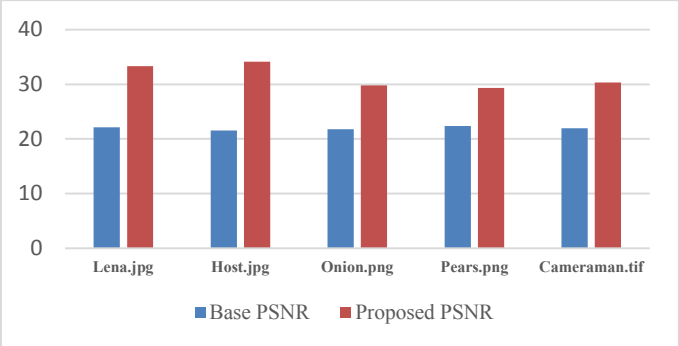
Image	Base MSE	Proposed MSE
Lena.jpg	397.351	30.378
Host.jpg	453.8112	25.31
Onion.png	437.99	68.44
Pears.png	376.98	75.95
Cameraman. tiff	415.59	60.381

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

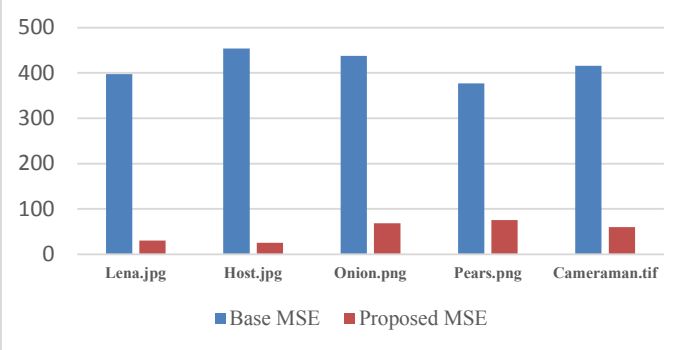
Table 3- SSIM comparison base and proposed

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. tiff	0.578	0.965

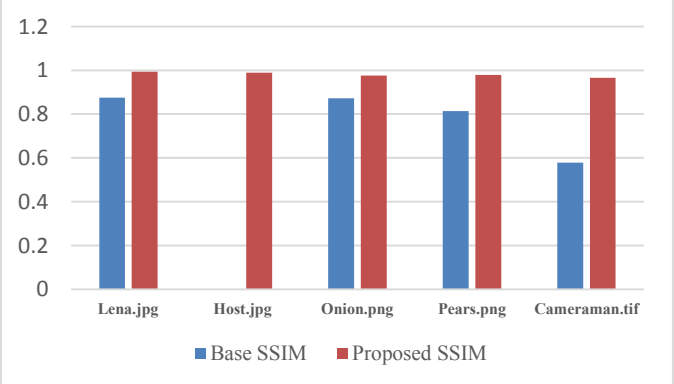
On various image SSIM comparison base and proposed technique and then find various result.



Bar Chart 1- PSNR comparison base and proposed



Bar chart2- MSE comparison base and proposed



Bar chart 3- SSIM comparison base and proposed

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.

References

[1]. " Image Techniques over Segmentation: A Survey",byWaseem Khan, Journal of Image Vol. 1, No. 4, December 2013, pp: 166-170.

[2]. "Survey on Segmentation of Image methods and Color Models",by Savita Agrawal and Deepak Kumar, (IJCSIT) International Journal of Computer Science and Information Technologies, Vol. 5 (3) , 2014, 3025-3030

[3]. Prof. S. T. Khandare and Mr. Akshay D. Isalkar," A Survey on Segmentation with Thresholding", IJCS, Vol.3 Issue.1, January-2014, pg. 441-446

[4]. S.Karthick, Dr.K.Sathiyasekar.andA.Puraneeswari," A Survey Based on Region Based Segmentation", International Journal of Engineering Trends and Technology (IJETT) – Vol 7 No. 3- Jan 2014, Page 143-147.

[5]. Avik Banerjee, SoumyadeepBhattacharjee, Sk. Latib," Segmentation of Image Using Region Derived Triple Thresholding", 2016 IEEE

[6]. ChiranjeevSagar " Color Based Segmentation of Skin from Clinical Images for the locating of Melanoma", 1st IEEE International Conference over Power Electronics (ICPEICES-2016)

[7]. Siyu Lu, Ling Lei, Hui Huang and Liang Xiao," A Hybrid Extraction-Classification Method For Brain Segmentation In MR Image", 2016 9th International Congress on Image and Signal Processing, CISP-BMEI 2016), pp: 1381-1385.

[8]. R. R. Gharieb, G. Gendy and A. Abdelfattah,"Robust Local Data and Membership knowledge Based FCM algorithm for Noisy Image Segmentation",2016 IEEE, pp:93-98.

[9]. Shaoyi Li and Jun Ma," A Kernel Fuzzy Clustering Infrared Image Segmentation Algorithm Based on Histogram and Spatial Restraint", (CISP-BMEI 2016), pp: 313-318.

[10]. JingweiGuo, Yikang Yang, Qingwei Wu, Jionglong Su and Fei Ma," Adaptive active contour model based automatic tongue image segmentation", 2016 9th International Conference (CISP-BMEI 2016), pp: 1386-1390.

[11]. Wu Cao, Jiao Li, Jie Liu and Pu Zhang," Two Improved Segmentation Algorithms for Whole Cardiac CT Sequence Images", 2016 9th International Conference on Image (CISP-[1] bmei 2016 pp 346 351

[12]. Amit Singh Chauhan, Manish Dixit, Sanjay Silakari "Image Segmentation Methods: A Survey Approach" IEEE International Conference ,CSNT 2014 ,7-9 April, NITTTR,Bhopal

[13]. Praveen kumar prajapati, poonam sharma, manish dixit "a review on mr brain image segmentation based on different techniques" joosdt (2015), 9-14, stm journal, 2015, issn no. 2554-9355