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RESEARCH ARTICLE

A REVIEW ON ANALYSIS AND DIAGNOSIS OF DISEASES LIKE TUMOR USING MEDICAL IMAGE PROCESSING TECHNIQUES

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ABSTRACT

The field of image processing, image quality assessment is a fundamental and challenging problem with many interests in a variety of applications. Dynamic monitoring, adjusting image quality, optimizing algorithms and parameter settings of image processing systems are benchmarking in image processing system and algorithms. In this paper using such techniques we are going to analysis the detection of diseases like tumour for the ease in medical use.

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INTRODUCTION

Medical image processing is used for the diagnosis of diseases by the physicians or radiologists**.** Noise is introduced to the medical images due to various factors in medical imaging. Medical images include MRI, CT scan, X-ray images, ultrasound images etc. To diagnose diseases edge and details preservation are very important. Medical image denoising can help the physicians to diagnose the diseases. Advancements in medical applications has open up wide domains for CAD and CAM machines. The machines produce an output which cannot be fully trusted. This paper focuses on the accuracy of the system output generated. The most challenging clinical tasks performed by radiologists which leads to inaccuracy and inconsistency of the diagnosis. Factors that Influence Appearance of different Diseases Image. The output is taken from multiple machines which are then analyzed and studied. Finally, the output is observed by a doctor to confirm the results which increase the results.

PArametres for indentification

The appearance of tumor in an image depends on

- Imaging modality
- Image acquisition geometry

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- The physical parameter of the imaging system and biology.
- Image Enhancement (IET)
- It focuses on processing an image for specific Application.
- This technique that works well for X-ray topographic images.
- Image enhancement techniques work in frequency and spatial domains. The process can be g(x,y)=T[f(x,y)]
- Among these are histogram processing enhancement using arithmetic and logical operations & filters.

The HE techniques can be classified into various categories

1. Global Histogram Equalization
2. Local Histogram Equalization (LHE)
3. Brightness preserving Bi-Histogram Equalization (BBHE)
4. Dualistic Sub- Image Histogram Equalization (DSIHE)

GHE

GHE uses the histogram information of entire input image for its transformation function .The histogram of whole input image is first obtained, then the Cumulative Distribution Function (CDF) is calculated and gray transfer function is derived from the CDF .Though this global approach is suitable for overall enhancement; it fails to preserve the local brightness features of the input image. LHE tries to eliminate

such problem. It uses a small window that slides through every pixel of the image sequentially. It makes use of the local information in a better Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined manner. This technique has the problem of enhancing the noises in input image along with the image features.

- There are two basic types of quality measures subjective and objective.

Subjective quality Measure

- Measure of Image quality (perceptual quality). The enhanced of image quality is specified by Mean Opinion Score. It is result of perception based subjective evaluation.
- Grading scale of MOS is 5-pleasant or excellent 4-good, 3-Acceptable, 2-poor quality & 1-unacceptable.

Histogram Equalization

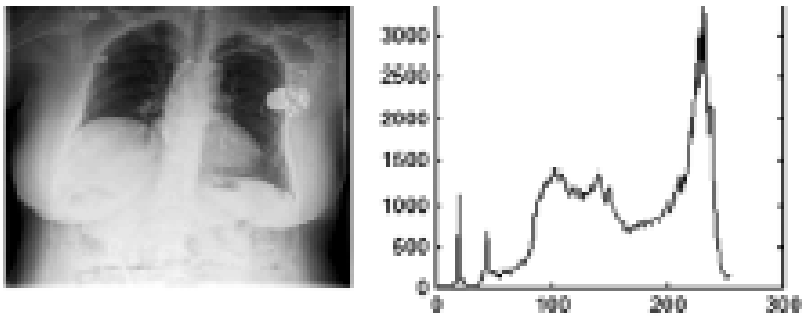


Figure 1. An image and its histogram before equalization

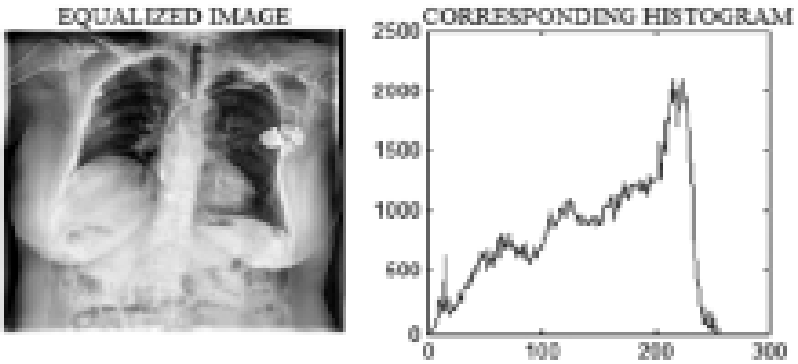


Figure 2. An image and its histogram after equalization

BBHE and DSIHE

BBHE and DSIHE are the variants of HE based contrast enhancement. BBHE divides the input image's histogram into two parts based on mean of the input image and then each part is equalized independently. This method tries to overcome the problem of brightness preservation. DSIHE method is similar to BBHE except that it separates the histogram based on median.Though these methods can perform good contrast enhancement.Also cause more annoying side effects depending on the variation of gray level distribution in the histogram.

Filtering and Quality Measures Techniques

Noise filtering methods for Medical Images Categorized

1. Linear filtering
2. Non linear filtering.
3. Sliding window filter

Image Quality Measure

- IQM use in the development of image processing algorithm such as enhancement, deblurring, denoising etc and are used to evaluate their performance in terms of quality of processing image.

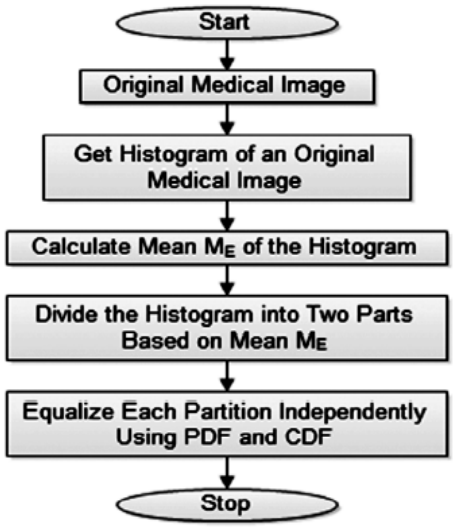


Figure 3. Flow chart for BBHE

MOS=1/NO ∑i Pi ,i=o to s -1

(Where i is an image score)

Objective Quality Measures

1 Absolute Mean Brightness Error(AMBE)
(i.e. Preserving the original brightness)

2 Maximum difference (MD)
MD=max [I(i,j)-*I(i,j)]

3 Mean square Error (MSE)
MSE=1/MN ∑ ∑ SQUARE [I(i,j)-*I(i,j)]

4 Normalized cross correlation
NK=∑ ∑ [I(i,j)* ^I(i,j)]/ ∑ ∑I(i,j)2

Where
I(i,j)=input image
& I^(i,j) Enhanced image its value range from [0,1].

Subjective and objective Assessment

Subjective evaluate the enhancing quality using MOS.As there is lesser variation in Maximum difference and AMBE have lower values for all test images, which reflect brightness preserving property. The reliability of objective image quality measurement can be evaluated by finding the relation between objective and subjective image quality measurements. The image quality improves after image enhancement and filtering.

Analysis

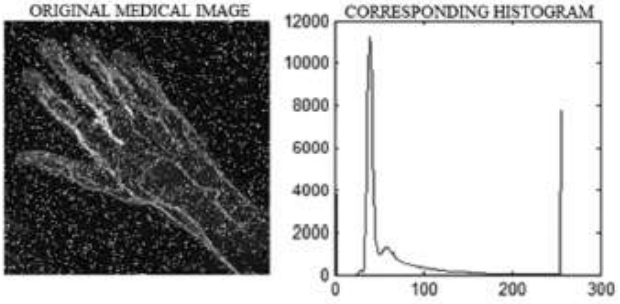
Experimental analysis was carried out using two main step:-

I. Enhancement of medical images using GHE/LHE/ DSIHE/ BBHE histogram processing techniques (HPTs).
II. Median filtration to eliminate noise from enhanced medical images.
III. X-Ray of jpg formats size 10*377, 500*392, 256*256, 512*512 were taken as test images and median filter of 3*3 mask size was used.

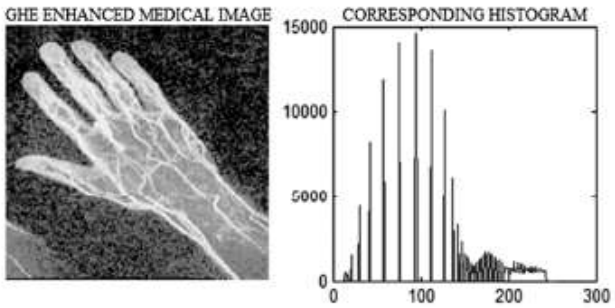
Performance Analysis

Various image enhancement techniques based on GHE/LHE/BBHE/DSIHE are taken up For comparison on single platform using five different medical images and their performance in terms of AMBE/MD/MSE/NK are calculated.

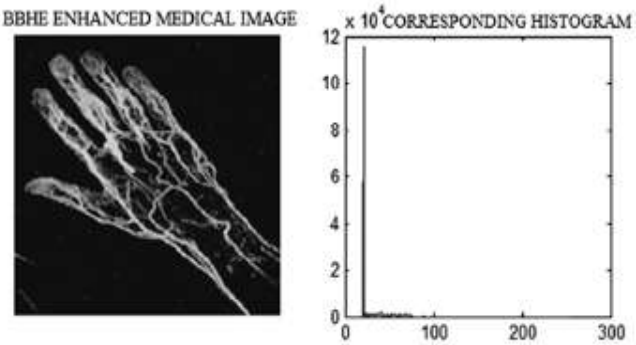
RESULTS



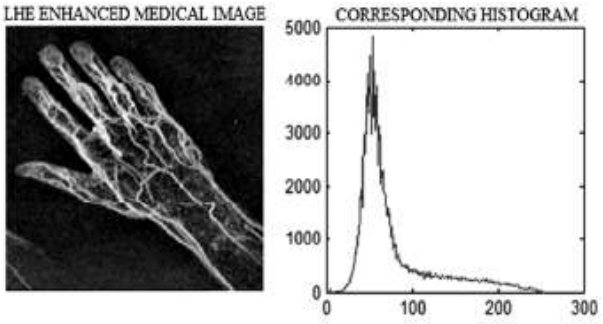
(a) Original Image and Its Histogram



(b) GHE Enhanced Image and Its Histogram



(d) BBHE Enhanced Image and Its Histogram



(c) LHE Enhanced Image and Its Histogram

Image Quality Measures for tst_img_2

IQMs / HPTs	AMBE	MD	MSE	NK
GHE	75.7579	240	8637.75	1.26263
LHE	14.0075	251	3182.77	0.895715
BBHE	16.0726	230	3442	0.431795
DSIHE	28.3538	255	3494.38	0.422883

Image Quality Measures for tst_img_3

IQMs / HPTs	AMBE	MD	MSE	NK
GHE	31.8054	255	3336.941	0.789601
LHE	9.64372	251	2681.91	0.886626
BBHE	39.8047	255	4341.79	0.691365
DSIHE	105.275	255	13463.7	0.372864

Table 4
Image Quality Measures for tst_img_4

IQMs HPTs	*AMBE*	*MD*	*MSE*	*NK*
GHE	72.3432	241	7936.77	1.34804
LHE	18.6457	255	3124.11	0.938378
BBHE	19.4708	255	3112.9	0.474373
DSIHE	347.7412	255	3643.54	0.41441

Conclusion

1. The results reflect that their high quality after applying LHE and DSIHE techniques.
2. LHE gave better result than GHE.
3. BBHE and DSIHE methods preserve the brightness of original image.

REFERENCES

Jabarullah BM, Saxena S, Kennedy Babu CN. 2012. Survey on noise removal in digital images. *IOSRJCE*, 6(4):45–51.

Khan W. 2013. Image segmentation techniques: A survey. *Journalof Image and Graphics*, 1(4):166–70.

Kherikhah E, Tabtabaie ZS. 2015. A hybrid face detection approach in color images with complex background. Indian *Journal of Science and Technology*, 8(1):49–60.

Maity, A., Dasgupta, S. and Paul, D. 2008 A Novel Approach to Face Detection using Image Parsing and Morphological Analysis. *International Journal of Computer Trends and Technology (IJCTT)*, V.23(4):155-161.

Suh, B., H. Ling, B. B. Bederson, and D. W. Jacobs. 2003. Automatic thumbnail cropping and its effectiveness. In *UIST*, pages 95–104.

Walther, D., L. Itti, M. Riesenhuber, T. Poggio and C. Koch. 2002. Attentional selection for object recognition - a gentle way. In *Biol. Motivated Comp. Vision.*

Zuva T, Olugbara OO, Ojo SO, Ngwira SM. 2011. Image segmentation, available techniques, developments and open issues. *Canadian Journal on Image Processing and Computer Vision*, 2(3):20–9.

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