"Image Enhancement Using Crossbreed Wavelet Neighbour Method"

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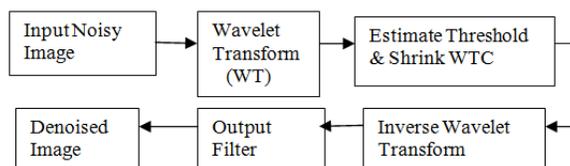[2]Asst. Professor, RIET PHAGWARA (JALANDHAR)

ABSTRACT

Denoising is the primary operation in medical image processing to remove the unwanted noise present in the image there by we eliminate redundant data. Here crossbreed wavelet denoising techniques are compared based on different parameter to obtain accurate results.

Index terms: wavelet, denoising, wavelet.

1. INTRODUCTION

The image usually has noise which is not easily eliminated in image processing. According to actual image characteristic, noise statistical property and frequency spectrum distribution rule, people have developed many methods of eliminating noises, which approximately are divided into space and transformation fields The space field is data operation carried on the original image, and processes the image grey value, like neighbourhood average method, wiener filter, centre value filter and so on. The transformation field is management in the transformation field of images, and the coefficients after transformation are processed. Then the aim of eliminating noise is achieved by inverse transformation, like wavelet transform. Successful exploitation of wavelet transform might lessen the noise effect or even overcome it completely. The general wavelet denoising procedure is as follows:

• Apply wavelet transform to the noisy signal to produce the noisy wavelet coefficients to the level which we can properly distinguish the PD occurrence.

• Select appropriate threshold limit at each level and threshold method (hard or soft thresholding) to best remove the noises.

 • Inverse wavelet transforms of the threshold wavelet coefficients to obtain a denoised signal

Block diagram of Image denoising using wavelet transform.

WAVELET FILTER

Wavelet denoising reduces high frequency noises. A wavelet is an wave-like oscillation with an amplitude that begins at value zero, increases, and then decreases back to zero value a direct wavelet can be computed from original image.

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2. RELATED WORK

Author	Year	Work done
M Rama Bai , Dr V Venkata Krishna	**2012**	This paper examine the distribution of intensity values of neighbourhood of a given pixel and determine if the pixel is to be classified as an edge and new morphological approach for noise removal edge detection is introduced for both binary and gray scale images.

Mitra Basu	**2011**	It described a survey of Gaussian-based edge detection techniques and detects the locations of these intensity transitions. The edge representation of an image drastically reduces the amount of data to be processed, yet it retains important information about the shapes of objects in the scene.
Mohamed A. El-Sayed	**2009**	It describe the hybrid entropic edge detector presented and it uses both Shannon entropy and Tsallis entropy, together. The proposed method is decrease the computation time with generate high quality of edge detection.
Manimala Singha and K.Hemachandran	**2001**	This approach is presented for denosing by combining the color and texture features called Wavelet-Based Color Histogram Image Retrieval (WBCHIR).
Zhi-Hua Zhou, Ke-Jia Chen, and Yuan Jiang	**2000**	It describe that applying semi-supervised learning and active learning together to DENOISING

3. PROPOSED WORK

The proposed method is a variant of the Canny edge detection technique. In Canny's method the first step is to smooth the image to eliminate the noise in the image. For this task Gaussian smoothing filter is adopted which does not preserves the edges. So we adopt Adaptive filter which preserves the edges of the objects while smoothing the image. The steps of the Image edge detection using Adaptive filter technique are as follows:

1) Use the Adaptive filter for Smoothing image: The first step is to remove or minimize noise in the original image before trying to locate and detect any edges.

2) The Adaptive smoothing is a class of typical nonlinear smoothing technique.

3) The adaptive filter is based on the neighborhood of each and every pixel for their mean value which preserves the edges in the given image. The algorithm for smoothing the image using Adaptive filter is as follows:

Algorithm:

1) Initialize

a) Input image

b) Initialize termination condition, t (number of iterations)

2) Find the images that are equivalent to original image in red, blue and green color Spaces

3) Find the number of rows and columns of the image

4) Find the eight neighborhood pixels of each pixel

5) Compute the difference (d_i) of each pixel with its neighboring pixels in R,G and B color spaces respectively

6) Normalize the d_i values between 0 and 1

7) Compute $C_i = (1-d_i)t$

8) Multiply each C_i with corresponding neighborhood pixel in R,G and B color spaces respectively repeat steps 4 to 7 for each pixel in the image i.e rows x columns

9) Concatenate the above three images(R,G and B color spaces) repeat steps 2 to 8 until t is satisfied.

4. OBJECTIVES

Our objective is to design an algorithm to work on the parameters of the corrupted noisy images. The algorithm includes the following steps to find the edges of the images:

4.1 Firstly the noise is removed from the corrupted image to find out the correct edges of the image.

4.2 Close parameters (Noise Level at different Densities, PSNR, Noise Suppression) are determined to recognize the image properly.

4.3 On the basis of close parameters, noisy pixels are replaced by the most appropriate values and the edges are determined efficiently.

4.4 At last we will get a noise free image.

5. METHODOLOGY

5.1 Create Database and upload desired image.

5.2 Add noise in the image at 16% and 25% level.

5.3 The remove the noise from the image by using filter and apply the Gaussian filter, Adaptive mean, hybrid Mean to obtaining three filtered image (noise free image).

5.4 Calculate the PSNR value and Compare the results.

5.5 Finally we will detect the edges of the image and then retrieval the image from the Database.
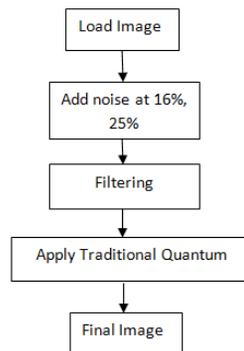
6. RESULT & CONCLUSION

In the work till now, we have implemented the general edge detection techniques to check out how a image gets fetched out from the database. For this purpose it is required to have a database which consists of images which can be processed through the coding platform. After the creation of the successful database, it is required to check out that over which parameters the processing is possible. There are several features over which an image can be judged. Some of them are the outer edges of a image, if a colour image has been taken into the consideration, it is required to check out the colour combination pattern of the images.The noisy image will be divided into three categories. The three categories would be red, green and blue and then a pixel management would be done to check out whether the ratio of the found arguments matches our requirement or not. As in the proposed methodology, it has been mentioned that, the processing will go through each and every pixel. Every image in the data base will be portioned into the pixels and its red green and blue components would compare with the previous stored components. Now, if the found component value will be found to be more it would move to the queue downward and hence in such a manner each and every image would be compared and they would be stored into an array. Finally a sorting would be done to find out the best suited image after the removal of the noise from the image.
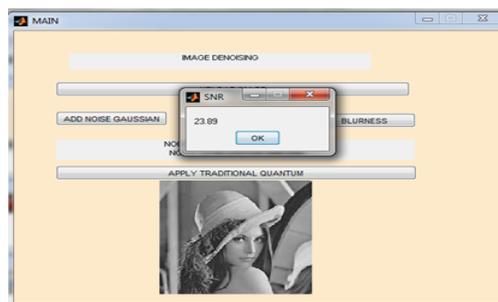

Image	Noise type	Noise level	PSNR
LEENA	GAUSSIAN	25	23.12
LEENA	UNIFORM	16	20.13
LEENA	BLUR	10	19.18
BOAT	GAUSSIAN	25	22.15
BOAT	UNIFORM	16	21.18
BOAT	BLUR	10	20.12

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