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AN OPTIMIZED TECHNIQUE FOR GRAY IMAGE EXTRACTION AND EDGE DETECTION IN RGB IMAGE USING NOVEL HYBRID BILATERAL FILTER AND WAVELET TRANSFORM

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Abstract: In present era the technology growing in drastic changes, even though in some areas are need to achieve numerous goals. Image processing is one of the field which every day the human interacting with image processing technology. Even though images which has preprocessed from image technology have some noise. The noise removal process is one of the new goals to the young scientists. So In this paper we have designed a new novel algorithm which will remove noise in RGB & GRAY images. While removing noise from images some properties may misplace the image like edges which will have good role to visualize. So such types of properties are recovering from the preprocessed images by using Novel Hybrid Bilateral Filter and Stationary Wavelet Transform. This process has three stage techniques. At first it will separate the given image into three images like Red image, Blue Image and Green Image. Secondly; it removes noise from the separated images like Red, Blue and Green images. Finally; it will reconstruct a new RGB image without thrashing of any information. This technique is useful for the cloud images, satellite images and windy images

.***Keywords***: RGB Image, Gray Image, wavelet Transform, Image Processing and image preprocess

1. INTRODUCTION:

Edge detection plays an important role in image processing. Especially still it is problematic in color images .This can be improved and remove the noise by using some filter techniques like Standard Deviation, Geometric ,Weiner etc[1]. A new threshold based edge detection algorithm is presented in Segmentation and object recognition using edge detection techniques and edge detection techniques for image segmentation. Some of the traditional and nontraditional noise removal filtering methods is providing poor results (de-noise) at high noise densities like Decision Based Algorithm (DBA), Standard Median Filter (SMF), Adaptive Median Filter (AMF), and Robust Estimation Algorithm (REA) [2]. The new distinction method proposed, called a novel quadratic type variation method for efficient salt-and-pepper noise removal which is constructed based on quadratic formulation and efficient noise detection and removal [3]. The Switching Bilateral Filter with a Texture/Noise Detector for Universal Noise[4] Removal which will work based up on detect and replace methodology. For dissimilarities of noise levels, a new tow stage robust methodology for low noise removal mean method is adopted and for high noise weigh, algorithm is used to de-noise[5]. Two stage video based salt and pepper noise removal algorithm is proposed, firstly decision algorithm detect the noise free and noise pixels within then selected window, secondly the pixel values are replaced with the trimmed median values and change the size of the window. Generally window based noise detection algorithms works on the pixel-wise relationship in fixed size window, and thus it leads to misclassify the normal edge and noise edges with the detailed pixel values[6]. To avoid the misclassification problem, an algorithm which treats the small-sized regions, and labeled by the multi-scale connected component labeling is presented in and region size can be considered as a clue during the noise detection procedure. By improving median filtering, a new methodology is proposed to removal of salt and pepper noise for both binary and gray level images .To remove salt and pepper noise, edge preserved and de-noising algorithm for digital color images is presented, it will work upon three steps: noisy pixel detection, replacement of noisy pixels, confirmation by comparing with a threshold and to improve the quality of the image median filter is used [7] . A new impulse noise removal filtering algorithm base din Decision based median filtering is presented which will replace the impulse noise corrupted pixel by the median of the pixel scanned in four directions, and signal restoration scheme is used to restorer from a reliable neighborhood. A novel geometric flow that penalizes irregularity in the curvature rather than its magnitude. To this purpose, a new algorithm develop, a simple criterion to measure the degree of local irregularity present in the curve, which is added as a stopping factor in the mean curvatureflow. To detect edges in color images with a threshold process which automatically selects a value for a given picture and after that a thinning technique is applied to generate edge maps is presented RGB planar images impulsive noise edge detector algorithm with different window size is presented a synthetic method, called Color Edge Detection in RGB Color Space Using Automatic Threshold Detection is proposed using Kuwahara filter to detect the edges of the images in RGB color space. Hence a new multidimensional wavelet filter selection in multispectral image compression method is proposed.

2. ALGORITHM PROPOSED

Step 1: Peruse the image 2D-image or 3D- images.
Step 2: Separate the Red, Green and Blue sub image from the given image.
Step 3: Apply NHBF filter for individual images which has extracted for denoise (2D-image and 3D image)

F = H.*G((iMin:iMax)-i+w+1,(jMin:jMax)-j+w+1);
E.q…..(1)

Where w is the window kernel(type of matrices)
H =half width,G=input image
i& j=maximum & minimum values of rows & columns
F=bilateral filter
Step 4: Merge all individual images to one image and apply SWT for abstracted pixel noise removal

G = swt2(swt2(f).*exp(i*2*pi*exp(-i*phase);
E.q..(2)

where f=input image
i=no of rows
phase=angle

Step 5: Apply edge detection method for individual image

$$\frac{1}{\sqrt{2^j}}\sum_{\theta=0}^{2\pi}\left(\frac{1}{2^i}(n-2^j m)\right)$$

E.q..(3)

Where m=nonnegative integer
n=negative integer
i,j are the rows & columns of the image

Step 6: Construct a new image from SWT to RGB

RESULT AND DISCUSSION:

The experimental results are shown from Figure 1 to Figure 9. Figure 1 shows how the cloud image input, figure 2, figure 3 and figure 4 shows the red, green and blue channel separate images. Figure 5 shows the SWT for RGB image. Figure 6 to Figure 8 shows edge channels of adjacent, horizontal, vertical and diagonal images. The comparison results are shown in Table, it describes that at first the mean filter de noise algorithm results are shown, at second NHBF de noise algorithm results are shown, third NHBF with SWT edge detection algorithm for 2D-images results are shown, finally we shown the results of NHBF with SWT edge detection for 3D-images are described. With this results we can analyze NHBF with SWT is better than other established de noise filtering techniques. The graph shows the result analysis of the proposed 2D and 3D images performance is fine compared with other usual methods.

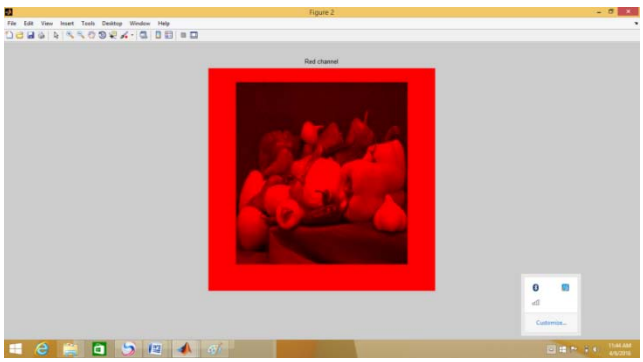


Figure 1: Separated Red channel image

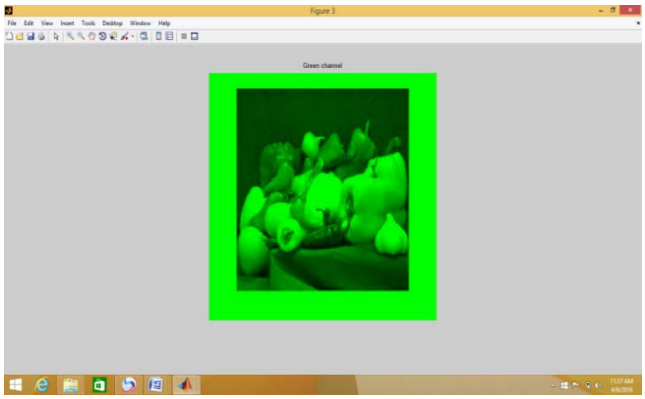


Figure 2: Separated Green channel image

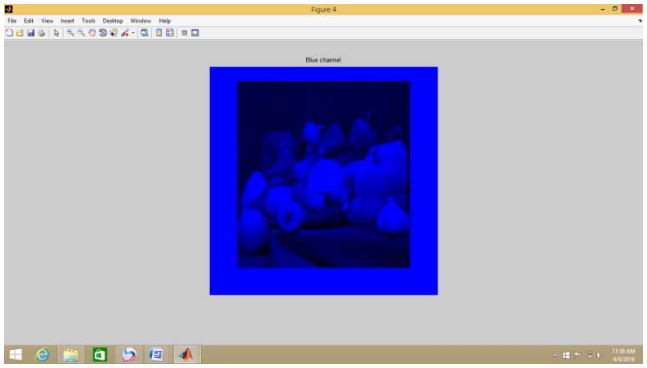


Figure 3: Separated Blue channel image

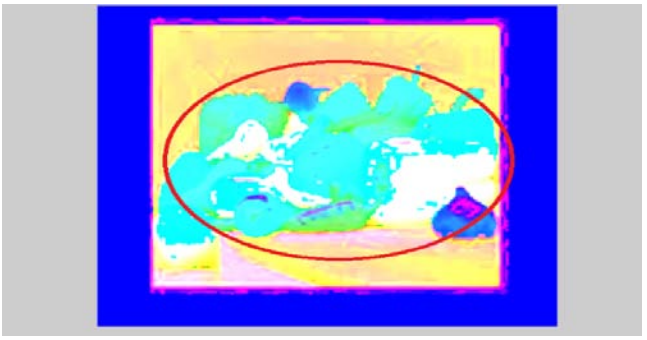


Figure 4: Adjacent RGB image

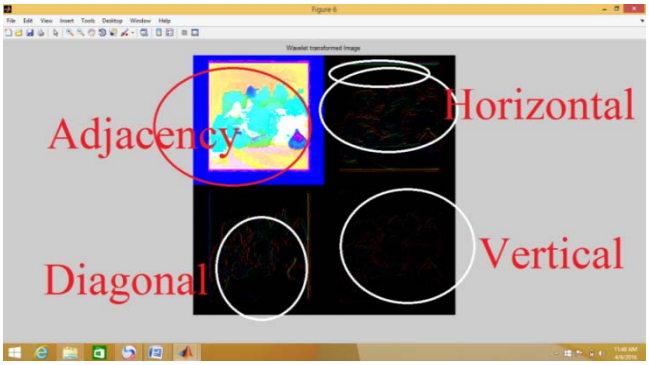


Figure 5: Stationary wavelet transform for RGB Image

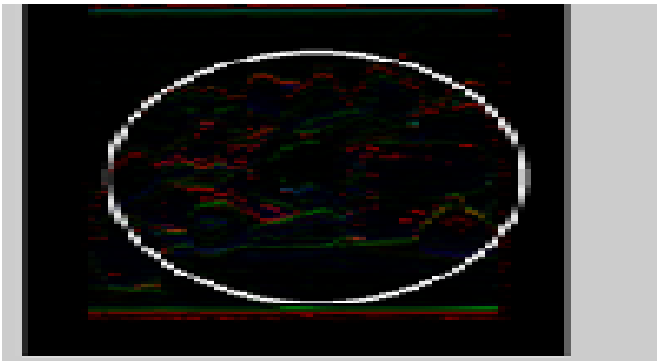


Figure 6: Horizontal RGB image

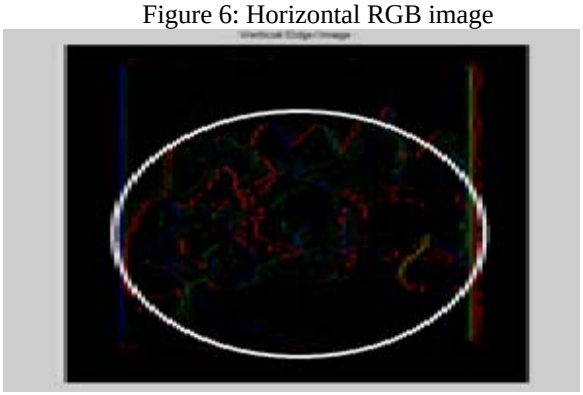


Figure 7: Vertical RGB image

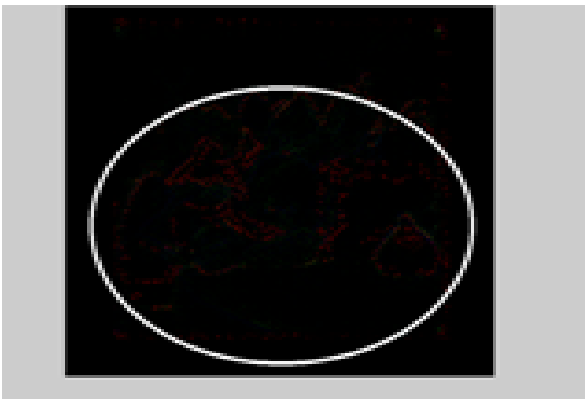
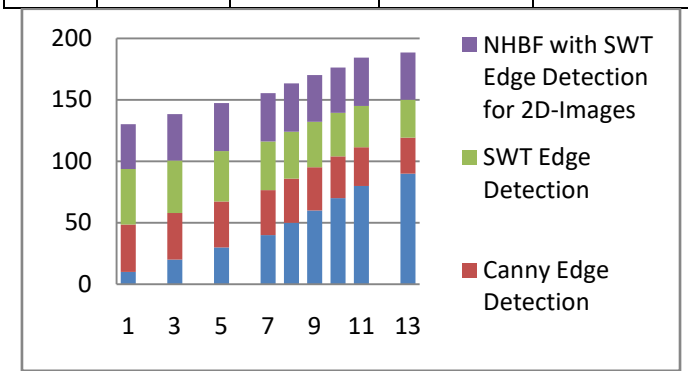


Figure 8: Diagonal RGB image

3. RESULT AND DISCUSSION:

Table : Comparison Result of NHBF with SWT Edge Detection

Noise Level	Canny Edge Detection	Stationary wavelet transform Edge Detection	NHBF with Stationary wavelet transform Edge Detection for 2D-Images	NHBF with Stationary wavelet transform Edge Detection For 3D-Images
10	38.587	45.119	36.4513	45.2166
20	37.953	42.761	37.6425	45.2550
30	37.273	41.077	39.0714	51.6966
40	36.625	39.463	39.3706	50.3706
50	35.929	38.179	39.2620	50.3706
60	35.224	36.915	38.0583	48.6526
70	33.999	35.436	36.8060	48.65523
80	31.503	33.545	39.3811	46.0732
90	29.315	30.870	38.3310	45.72514



Graph : Analysis results for the NHBF with SWT Edge Detection

4. CONCLUSION:

Many edge detection methods are proposed previously, even though every algorithm it has its own architecture. In this proposed method we have prepared robust algorithm for gray scale images and RGB images and 3D- images. The simulation results proved that this multilayer algorithm proved its own methodology which gives better results compared with traditional algorithms. In feature it may extend for the innovative dimensional of images.

5. REFERENCES

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