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A Weighted Unsymmetrical Trimmed Mean Median Based Impulse Noise Removal For Color Image Enhancement

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Abstract

The elimination of colour impulse noise in digital Image is a broadly renowned area of investigation. A typical problem in image analysis is the presence of colour noise sources, which originates at the moment of photograph acquisition or transport. Fixed valued and Random Valued Impulsive Noise, are two types of chromatic impulsive noise. Image enhancement, satellite imagery, medical imaging, and robotic all require colored image processing. Impulse noise is present in all of these applications. Since it protects edges, median filter is commonly used to eliminate this noise from an images. In the research work proposed a weighted unsymmetrical trimmed median for the elimination of impulse noise at both medium to high density values . Detection of the impulse noises on the basis of maximum and lowest pixel values is the first step in the impulse noise filtration, followed by the elimination of these noises. weighted unsymmetrical trimmed median computation is used in the second step of noise reduction for case-1, trimmed median for case-2, and WMF for case-3. Using noise-free pixels to de-noise an image achieves improved result and higher visual quality. Also present good result in terms of peak signal to noise ratio, mean square error and other result parameters.

Keywords- Color Impulse Noise, Weighted Mean filter, Weighted Median filter and RGB Color Model.

I. INTRODUCTION

The elimination of impulse noise is a widely researched issue in the field of image processing. Impulse noise is a prevalent issue in digital image processing, and that it occurs during the capture or transfer of photographs as well as videos. Salt and pepper noise (SPN) and Random Valued Impulsive Noise (RVIN) are the two types of impulsive noise that may be identified. Several areas, such as computer vision, remote sensing, medical imaging, automation, and other applications, make use of colour image processing (CIP). These implementations are identified by the existence of impulsive noise in the obtained images and the use of colour photos. The median filter is often used to eliminate this noise from an image since it also maintains edge detection while doing noise reduction. Interference, most of the time known as salt-and-pepper noise, may cause images to become corrupted. The elimination of impulsive noise during morphological procedures, image improvement, and other image processing processes is accomplished by using a variety of filters in image processing. A common use for this technique is in circumstances where edges must be maintained in order to perform higher-level operations such as segmentation, object classification, and other similar tasks [1].

The use of digital image processing may be found in a variety of areas nowadays, including computer vision, remote sensing, medical imaging, robotics, satellite imagery, and aerial photography. During the process of image capture, digital images are often damaged by a variety of types of noise [2].

There are many different options that can be implemented in image de-noising for constant value noise, salt-and-pepper noise (SPN) elimination throughout morphological procedures, visual improvement, and other image recognition activities [3].

The goal of image de-noising is to generate a clean version of a particular noisy image by using prior information of the characteristics of image features and applying that information to the provided noisy image. This issue has been intensively investigated, with major advances having been achieved in recent decades [4].

Fig 1. Noisy Image Fig 2. De-noised Image

In the above figure 1 shows the color image with impulse noise and and figure 2 shows the de-noised image. The “Linear operation” shown in Figure one.1 is that the addition or multiplication of the noise n(x,y) to the signal s(x,y) [01]. Once the corrupted image w(x,y) is obtained, it's subjected to the de-noising technique to induce the denoised image z(x,y). the purpose of focus during this thesis is scrutiny and contrastive many “de-noising techniques” (Figure one.1). In the next section discuss the noise model of fixed valued impulse noise as well as random valued impulse noise. After that discuss the previously presented work by different researcher in literature survey. Further discuss the proposed method in the section IV.Section V and Section VI explain the simulation results and conclusions, respectively.

II. NOISE MODEL

In principle, a digital image is represented as a matrix of gray or colored pixels. This matrices contains three variables inside the case of a picture, the third corresponding to the time. For "image pixel," each pair Iu(i) whereby u(i) is the values of I is termed pixels. For gray-level images (I) seems to be a position on a 2D grid as well as u(i) is a true value. Regarding traditional color images, u(i) is indeed a threefold value for the elements red, blue and green.

The Fixed-valued Impulse Noise (FVIN) as well as the Random-valued Impulse Noise are two prevalent forms of impulse noise (RVIN). They range in the quantities that may be taken by noisy pixels [6]. The FVIN is usually based on -

$$(Y_{ij}) = \left\{ \begin{array}{ll} X_{i,j} & with\ probabilty\quad p \\ (0,255) & with\ probabilty\quad 1-p \end{array} \right\} \ldots\ldots\ldots\ldots(1)$$

Here X(i,j) as well as Y(i,j) denotes the intensity value in coordinates (i,j) of the original and damaged images, p is the density of noisy. This model suggests that the pixels are periodically distorted by the same probability with two fixed extreme values, Zero as well as 255 (for 8-bit grey image). A model is considered as below:

$$(Y_{ij}) = \left\{ \begin{array}{ll} (0,m) & with\ probabilty\quad p1 \\ X_{i,j} & with\ probabilty\quad 1-p \\ (255-m,255) & with\ probabilty\quad p2 \end{array} \right\} \ldots\ldots\ldots\ldots(2)$$

Where p = p1 + p2. We refer to this model as Random valued Impulse Noise (RVIN).

Here

X(i,j) = intensity value,

Y(i,j) = Noisy pixel,

p = Noise density.

III. Literature Survey

In this section, we will discuss the different types of literature that have been presented in the last decade for impulse noise removal and image enhancement of the image. **Garg, B.** (2020) - In this research work, the authors present an effective method of removing noisy pixels by interpolating a new algorithm, which uses either the median of adaptive window size or a noise density-based approach to restore images. In addition, when there is a significant level of noise, the suggested ATM filter offers a fine estimate of noisy pixels accessible on the border by replacing them with pixels that have been analysed using the closest neighbour method. The suggested ATM method is studied across a variety of noisy test pictures (with a range of 10 percent to 90 percent noise density). On average, the suggested filter delivers 1.59 dB and 0.0548 at 0.37 dB as well as 0.0177 better PSNR and SSIM values, respectively, on grey scale pictures and picture elements, respectively. Finally, pictures filtered by this method have superior visual representation, even at high noise density **[1]**. Er**kan, U., et.al (2020,** June) - This presented filter's two-step process of removing salt and pepper noise (SPN) is explained in this article, which uses the iterative adaptive weighted mean filter (IAWMF). First, IAWMF recognises noisy pixels in the same way as AWMF does. While distinct from AWMF, this phase utilizes EPS-based weights to appraise a new gray-scale value. Noise of different levels may be removed using IAWMF, without the risk of introducing arch as well as edges. Additionally, IAWMF's inherent softness lends itself to fine details as well as margins. As seen in a number of testing scenarios, IAWMF's result outcomes are better as compared to similar methods [**2]**. **Satti, P., et.al** (2020),presented work, the authors presented an approach for removing salt as well as pepper noise called the innovative Min-Max Average pooling filter. The presented method uses three phases. First, the process is used to correct images with minimal data damage. This method makes two copies of the image as well as uses a distinct organisation of layers to capture changes in the image (from light to dark and vice versa). The last step utilises recombination with subsequent pooling on the border as well as edge details to get more detailed information. As the outputs of the simulations demonstrate, the suggested method offers better outcomes than previous research [05]. **Caliskan, A., et.al** (2020) The presented work introduces a novel method for increasing the performance of an adaptive noise-reduction network used in the salt pepper noise reduction. Twenty-eight neighbourhood pixels may be processed in a 3×3 window by combining the weights of twenty-eight NF networks fed by the 28 potential neighbourhood pixels. Additionally, studies have shown that one input modification method (which improves the accuracy of pixels received by NFFs) increases the performance of NF networks. This study also used an adaptable window with an extendable size that is capable of growing outward by one pixel in all directions [8]. **Jin, L., et.al (2019)** - In this research work proposed a CNN based de-noising method for impulse noise suppression in images. The deep CNNs included in the presented de-noising architecture are a classifier network and a regression network. To improve the picture's visual quality, the classifier network is trained to identify noisy pixels, as well as the regression system is taught to re-create the noisy image. Noise free pixels are applied to the noisy image and replaced by the regression network for filtering noise and restoring the noise free image. In the research, the new technique was discussed as being legitimate by providing significant performance gains over the prior state-of-the-art de-noising systems [10]. **Prabu, S., et.al** (2019),The presented research article describes a novel technique for filtering noise from a wide variety of MRI scan images by employing a histogram-based nonlinear filter. The data indicates that both subjective visual and structural properties, together with intention quality checks, show that the de-noising technique included the presented article eliminates noise while still preserving important structural details and sharp edges in a noisy image. In the study, the team discovered that the suggested filter is superior in all cases when it comes to removing noise and preserving medical image features [11]. **Thanh, D. N., et.al** (2019, March),presented article research work, researchers presented an improved BPDF filter. In addition to low noise levels, the approach discussed here performs well with extremely high noise levels (up to 99 percent). This research work focuses on different window sizes, 33 as well as 7 7 window size. The median value is used to replace the central pixel of the window. This research mainly focuses on higher noise values. When compared to other cutting-edge de-noising techniques, such as DAMF, this de-noising result is outstanding. As an alternative, the technique we've shown works quickly enough to deal with image noise on large and/or high-resolution imagery, involving a substantial number of calculations [12]. **Thanh, D. N. H., et.al.(**2019), An iteration mean filtering for eliminating salt pepper noise has been developed in this study. Using the median for the central pixel in a window of 3 3 pixels, this research would use a minimal mean. As a result, the IMF outperforms dynamic adaptive monitors in terms of effectiveness. High-density noise could be removed using the IMF due to an iterative technique that has been provided. There have been numerous studies demonstrating the IMF's ability to decrease noise while still preserving image frames, edges, and features. It's possible that this research will help to prove that IMF denunciation is more successful than existing state-of-the-the-art methods [14]. **Enginoğlu, S., et.al (2019),** presented article presented work, has shown that ARF is superior to alternative techniques of removing SPN noise for all noise densities, as tested by PSNR, SSIM, IEF, as well as VIF metrics. Although PSNR findings may not be very trustworthy, this study used this quality measure, which is recognised as well as utilised by the industry [15]. **Mafi, M., et.al** (2018), This research examines a robust edge detection approach that uses an integrated technique for filtering noisy images with significant noise. Even when subjected to high intensity levels, this mechanism remains resistant to salt as well as pepper noise. SAMFWMF is shown to provide optimum edge detection and edge detail retention, which is a goal. High correlation, structural similarity index, and peak signal-to-noise ratio tests are used to verify this study. To further illustrate this, researchers have collected additional de-noising filter validation data. There are two different edge-tracking techniques. Non-maximum suppression and a new edge following maximum sequence are used to follow the edges and deal with edge discontinuities as well as noisy pixels, particularly in the face of high-intensity noise levels above 80%. The binary image is generated by applying a set of predetermined thresholds to the grayscale picture. Morphological operations are then used to clean up the edges as well as eliminate noisy pixels. This makes way for edge thinning, which eventually produces an optimum edge detection technique. By comparing the results of the presented work to other state-of-the-art denoising filters and other edge detection techniques, the authors maintain that this approach is robust to impulse noise, even at high-intensity levels [16]. **Erkan, U., S. et.al (2018)** - presented article, a new method, DAMF, is used to mitigate salt and pepper noise at all resolutions. As a result of the study, these fundamental ideas were elucidated. The PSNR as well as SSIM findings of the images as well as the Lena image were later compared in this study using the DAMF technique as well as other approaches. The PSNR as well as SSIM outcomes for the Cameraman image with a salt pepper noise ratio of 30% are 28.27/ 29.28/ 29.44/ 32.09 and 0.9044/ 0.9324/ 0.7740/ 0.9494 for the PSMF, DBA, MDBUTMF, as well as NAFSM strategies respectively, whereas the DAMF method's PSNR as well as SSIM findings are 36.83 and 0.9844 respectively. According to this study [17], DAMF noise may be eliminated from all densities of SAP. **Erkan U., et. al.** (2018),presented article work, the authors studied the repetition counts of pixels. BPDF eliminated salt and pepper noise, as well as achieved a 50% noise density better than the others. Noise density levels have an impact on the success of these plants. BPDF ignores noisy pixels when it processes noisy pixels, since it doesn't remove them from the screen through a threshold value, but it does take the noisy pixels into consideration if there is any uncertainty regarding the noiselessness of any adjacent pixels of the processed pixel. Every filter has its own specific challenges as well as achievements. Perhaps the best thing is to create a hybrid filter that detects the noise density of an image as well as utilises a filter for each level of noise density [18]. **Singh, V., et.al** (2018) This research article describes a new approach to reducing gray-scale image noise by using a unique Type-2 fuzzy filter. The two suggested methods are used to identify noisy pixels in the fuzzy filter's first stage. The following phase includes miserable pixel denoising in the corresponding filtered image, using the suggested weighted mean Type-1 fuzzy method. The solution has been tested on several grayscale images. According to the findings of the research, the suggested filter performed better than existing state-of-the-art techniques. Furthermore, the filter can retain image features even at 99 percent noise [19].

Huang, Y. M., et.al (2018), This research is difficult because of its NP-hardness and non-convexity. The issue of rank minimization is difficult. The convex hull of matrix ranks is known as nuclear norms, but it has been used as a replacement for matrix ranks in rank reduction issues. As a solution to the issue of minimising ranks, this article explores it via the inclusion of Frobenius norm for data integrity term as well as rank for regularisation term in the cost function. The optimization issue being researched here can be resolved by a hard-thres holding operator. Utilizing a patch-based non-local self-similarity block matching method to leverage patch similarities, the researchers used the suggested rank reduction algorithm for removing picture noise in this study [20].

IV. Proposed Method Weighted Unsymmetrical Trimmed Mean Median

Proposed work introduce a weighted approach for color noise elimination by modified weighted unsymmetrical trimmed mean median.Introduce a new approach for the elimination of colour impulses by modifying the weighted unsymmetrical trimmed mean median in the proposed De-noising algorithms have been suggested for a wide range of applications, however many of them are application-specific. Identification as well as distortion reduction or improvement are two of the key phases in image processing. If you have a 3-by-3 window, we get the better effect with the suggested approach, which means that enough quality is stored then you get better quality images even with higher levels of noise.. The suggested technique uses MATLAB to simulate the entire event. First, a colour image is taken, and then a fixed valued impulse noise (FVIN) is applied to the targeted image. The result is a coloured noise image that is courted by colour impulse noise.Perform pre-processing operations to color noise images when begin image analysis such as re-sizing and spiting image into red, green and blue format. In the below figure 3 shows that

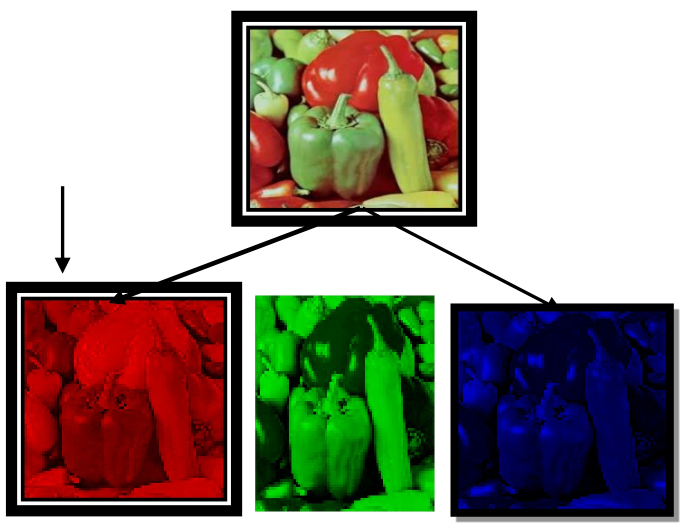


Fig. 3. Color image RGB form

Now discuss the algorithm of proposed method, which is shown in below .

<u>Algorithm.Weighted Unsymmetrical Trimmed Mean Median</u>

1. Start

2. x = uigetfile(input);

3. y = read(input--> x);

4. Z = Resize (512X512{(y)})
5. Im(r) = (:, :, 1)   %Red
6. Im(g) = (:, :, 2) %Green
7. Im(b) = (:, :, 3) %Blue
***8.* // Noise Identification Stage**
9. *if   (Min value =0 && Max val = 255)*
10. Rx (i,j) = Min. Value <P(ij)< Max. Value
11. Gy (i,j) =Min. Value <P(ij)< Max. Value
12. Bz (i,j) = Min. Value <P(ij)< Max. Value
***13.* Noiseless Pixels**
14. *else   (Min value =0 && Max value = 255)*
15. Y_{ij} = Noise Pixel (Next Step) % 0 and 255
16. *End*
17. Rx (i,j) ≠ Min. Value <P(i,j)< Max. Value
18. Gy (i,j) ≠ Min. Value <P(i,j)< Max. Value
19. Bz (i,j) ≠ Min. Value <P(i,j)< Max. Value
20. **In case A** - If the elements in a 3*3 are zeros(0) that P1 to P9 are zero –
21. *if*
22. $Y_{ij} = \begin{array}{ccc} 0 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{array}$
23. Weighted Mean = $\sum_{A1}^{A9}[Y_{ij}]$ **/** Total number of element
24. P5(Central Pixel) = replace (Weighted Average Value)
25. else
26. Moved to Third Step
27. *End*
28. **In case B -** If the elements in a 3*3 are 1's
29. // Trimmed Median filter
30. If   (255 = 1) % 8 bit color image maximum value
31. $Y_{ij} = \begin{array}{ccc} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{array}$
32. TrimmedMedian = $\sum_{A1}^{A9}[Y_{ij}]$ = [255,255,255,255,**255**,255,255,255,255]
33. P5(Central Pixel) = replace (Trimmed Median vale 5th element of array*)*
34. else
35. Moved to Third Step
36. *End;*
37. $\begin{array}{ccc} 0 & 255 & 0 \\ 255 & 0 & 255 \\ 255 & 255 & 0 \end{array}$ {Now take a [P_5]}

$$\begin{array}{ccc} 0 & 255 & 0 \\ 255 & A5 & 255 \\ 255 & 255 & 0 \end{array}$$

38. Then compute the total weight of all the components -   [W (255)] = 2.512
39. [W (0)] = 0

40. Assign weight to the all 3*3 elements

$$41.\ \text{Weighted (Median)} = \begin{matrix} 0/0 & 255/2.512 & 0/0 \\ 255/2.512 & \mathrm{A5} & 255/2.512 \\ 255/2.512 & 255/2.512 & 0/0 \end{matrix}$$

42. Weighted (Median) = [0 + 101.51 + 0+101.51+101.51+101.51+101.51+0] /8 = 63.44

43. Median_val = A5 pixel value repalecd by median102.

47 End

In each colour frame, all noisy pixels have indeed been deleted, and the noise-free values have also been recreated. In the final phase, the three primary colored frames are put together just to create the noiseless colored image. Whereas if 3 * 3 filters frame has been used, then outcome will be appropriate. After computing the average for each of these nine elements in the filtering frame, the image obtained in the previous step is again de-noised by recalculating the destination pixels. All 3-by-3 frames and all (512X512) images are affected by these occurrences.

Therefore a stronger de-noised image being generated with enhanced Signal to noise ratio and also presents a good photo with significantly lower distortion but also increased visual as well as human sense.

IV.SIMULATION AND RESULTS

This section describes concerning simulation and result analysis.The conferred formula is tested and compared for variouscolor images (Shown in Figure 5) of size 512×512 pixels corrupted by completely different noise density (%) (from 10% to 90%). Results are describing by graphs and tables and conjointly compare results of planned work with previous work. During this section, the results of the planned technique for removal of mounted valued impulse noise is shown. We have use MATLAB R2015b (8.0.0.783) computer code for simulation of planned technique. To perform our new approach we've got to require completely different customary images size 512×512 as a reference images for testing purpose. The testing images are by artificial means corrupted by Salt and Pepper impulse noise by victimization MATLAB and images are corrupted by completely standard color scale level. Basic configuration of our system is Manufacturer: Hewlett-Packard HP 4540s Processor : Intel(R) Core(TM) i3-5005U CPU @ two.00 ghz with four.00 GB (2.64 GB usable) RAM : System type: sixty four-bit software. De-noising performances are quantitatively calculated by the PSNR and MSE as represented in analysis section severally.

A. PSNR

The PSNR is frequently used to assess the quality of a de-noising image reconstruction process. The main work focused on images in colors. Images in this colour palette consist of red, green, and blue (R, G, B) frames.

$$\text{PSNR} = \mathrm{R}\{10\log_{10}\frac{(255)^2}{(\mathrm{MSE})}\} + \mathrm{G}\{10\log_{10}\frac{(255)^2}{(\mathrm{MSE})}\} + \mathrm{B}\{10\log_{10}\frac{(255)^2}{(\mathrm{MSE})}\} \qquad 3$$

B. MSE

Mean Mean square error is referred to as the MSE . The three mean square values are thus calculated: the mean square error in red, the mean square error in green, and the mean square error in blue. Finally, add the values in red, green, and blue to get the final MSE.

Where MSE is:

$$\mathrm{MSE(R)} = \frac{\sum_{i=1}^{m}\sum_{j=1}^{255}\{\mathrm{Y(i,j)} - \widehat{\mathrm{Y}}\mathrm{(i,j)}\}^2}{\mathrm{m \times n}} \qquad 4$$

$$\mathrm{MSE(G)} = \frac{\sum_{i=1}^{m}\sum_{j=1}^{255}\{Y(i,j) - \hat{Y}(i,j)\}^2}{m \times n} \quad 5$$

$$\mathrm{MSE(B)} = \frac{\sum_{i=1}^{m}\sum_{j=1}^{255}\{Y(i,j) - \hat{Y}(i,j)\}^2}{m \times n} \quad 6$$

Where MSE acronym of Mean Square Error stands for image enhancement factor, $m \times n$ is the size of image,Y shows the original image, $\hat{Y}$ shows the de-noised image.

C. RMSE

RMSE is an important parameters of quality check parameters. RMSE calculate the by square root MSE. For compress this value use root mean square error value (RMSE).

$$\mathrm{RMSE} = \sqrt{\sum_{i=1}^{m}\sum_{j=1}^{255}\{\mathrm{MSE(r)} + \mathrm{MSE(g)} + \mathrm{MSE(b)}\}} \quad 7$$

D. Time

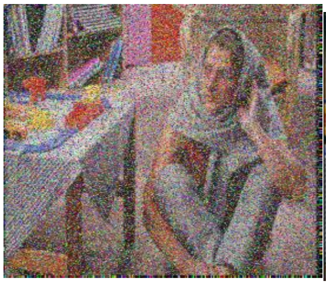
Total time taken to complete run process is proposal to the complex-city. If time consumption is high, then complex-city of algorithm is also high.

E. Standard Image Data set -

For the experimental analysis of proposed method required standard image which is downloaded by standard library of Kodak Benchmark Kodak Benchmark, BSD68, BSDS300, BSDS and UC Berkeley

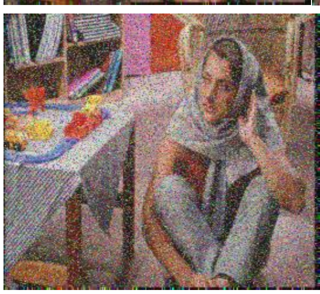
Fig. 4 Shows Standard images of data set [34][35]

(a) Noise Free



(b) 10% noisy image (c) Restored at 10%

(d) 20% noise (e) Restored at 20%



(f). 30% Noise (g). Restored at 30%

(h)40% noise (i) Restored at 40%

(j) 50%Noise (k) Restored 50%

(l) Restored 60% (m) Restored 60%

(N) Noise70% (O) Restored at 70%

(P) Noise 80% (Q) Restored at 70%

(R) Noise 80% (S) Restored at 80%

Fig 5. De-Noised Colored Images on Different Noise Densities 10% to 90% by Proposed Method

The PSNR and different parameters values of the planned algorithmic rule is shown within the higher than table at completely different noise density level.There are 5 completely different parameters are takenPSNR,MSE, RMSE, and Time complexity. During this higher than table clearly show that increases the extent of noise PSNR decreasing. The discussion of barbera results of planned technique currently analysis the results of pepeer image that is simulated on matlab the result of planned filter is shown in below figure 5.(A) to 5. (S) The results of conferred filters are shown in below. Table 5.1 shows the analysis of PSNR values of assorted de-noising strategies for Pepper image. The ends up in the Table two clearly show that the PSNR of planned technique is best at low and medium density of noise.

In the higher than table 3.shows the pepper image at totally different noise density. There are five different parameters are calculated for pepper image that's shown within the higher than tables. The parameters are PSNR,MSE,RMSE,IEF and Time complexity of planned algorithmic ruleResult Compare with completely different approach. In the below table 4 shows the resultcomparison of planned filter with totally different previous filters that in shown in below table . For the result comparison use peak signal to noise magnitude relation at four completely different image – 'Lena', 'Pepper', 'Baboon' and 'Barbera'. The result compare at five different noise density level that 10%, 30%, 50% , seventieth and ninetieth. There are six completely different previous strategies are use for result comparison.

Table 2. Result of Barbera Image at different Noise density

Noise Density	PSNR	IEF	MSE	RMSE	Time
10%	36.7	124.8	14.2	3.8	17.1
30%	32.10	118.5	40.8	6.4	15.3
50%	29.9	109.10	66.10	8.2	18.10
70%	28.4	97.10	94.9	9.8	22.6
90%	27.3	88.1	124.8	11.2	25.2

Table 3. Result of Pepper Image at different Noise density

Noise Density	PSNR	IEF	MSE	RMSE	Time
10%	40.4	388.7	6.4	2.6	9.5
30%	36.3	358.9	15.7	3.10	14.7
50%	33.10	316.5	26.2	5.2	18.5
70%	32.4	280.4	37.10	6.2	22.3
90%	30.9	238.5	53.9	7.4	25.2

Table 4. Shows Result Comparison of Presented Method with Previous Methods

Image	Noise	AMF [33]	MDBUTMF [26]	IBDND [23]	CMF [25]	IBINR [22]	UMWF [04]	Proposed
Lena	10%	36.9	42.5	42.6	42.1	42.9	43.3	42.3
	30%	32.5	36.3	42.6	42.1	42.9	37.6	**37.6**
	50%	29.2	31.8	42.6	42.1	42.9	34.5	**35.2**
	70%	25.10	29.2	42.6	42.1	42.9	31.5	**33.4**
	90%	21.3	24.10	42.6	42.1	42.9	27.2	**31.8**
Peppers	10%	35.1	39.1	30.10	39.5	40.6	41.5	40.4
	30%	30.9	33.6	30.1	34.1	34.10	36.2	**36.3**
	50%	27.10	30.1	28.8	30.10	31.9	32.10	**33.10**
	70%	25	27.8	27.3	28.4	29.2	30.2	**32.4**
	90%	20.3	23.10	23.9	24.9	25.6	26.3	**30.9**
Baboon	10%	26.4	31.5	38.10	38.10	38.10	38.10	32.2
	30%	23.9	26.4	26.3	26.8	27.4	27.7	**27.7**
	50%	21.6	23.1	24	24.1	24.6	24.8	**25.6**

	70%	19.5	21.2	21.10	21.9	22.3	22.5	**24.2**
	90%	16.10	19.3	19.1	19.7	19.7	19.9	**23.3**
Barbara	10%	28.2	33.8	34.7	34	34.10	35.2	36.7
	30%	25.10	28.5	29.5	29.1	29.6	29.8	**32.1**
	50%	23.8	25.2	26.8	26.4	26.8	26.9	**29.9**
	70%	21.7	23.3	24.5	24.3	24.6	24.7	**28.4**
	90%	18.8	21.8	21.5	22.2	22.8	22.3	**27.2**

V.CONCLUSION

The Color impulse noise has also shown that designed filter is indeed very effective since almost all noise is non-uniform throughout a channel's range. The idea of a trimmed weighted mean median filter had been used to identify and eliminate impulse noise. The PSNR (Peak Signal to Noise Ratio) [19] is pretty good, and the MSE (Mean Square Error) is incredibly low, even for extremely noisy images, such as those with a 30% noise level. As compared to other algorithms such asAMF[33],MDBUTMF [26],IBDND [23],CMF[25], IBINR[22] and UMWF[04], this one is straightforward and involves much less computations. It is possible to preserve fine details in the picture due to the filtering window's small size (3*3) This filter can be used in image processing because of its simplicity of calculation. –

Visual formats with high noise densities perform better when photos are de-noised to the highest level possible, as seen by the resulting images. An better de-noised image quality was achieved with the intended approach, especially for images with greater impulse noise levels.

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