NOVEL SCHEME FOR THE REMOVAL OF BLOTCHES, BLACK BAND NOISE, STREAKS AND IMPULSE NOISE IN GRAY SCALE IMAGES

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Abstract
A Threshold based fixed 3x3 Non linear filter for the removal of image artifact such as blotches, black band noise, streaks and impulse is proposed. The algorithm detects the corrupted pixel, if the absolute difference between the processed pixel and the unsymmetrical trimmed midpoint is greater than a fixed threshold else termed as non noisy. Under high noise densities the computed median might also noisy. Hence the absolute difference of the median and unsymmetrical trimmed midpoint filter is greater than second threshold then the corrupted pixels are replaced by the trimmed midpoint of the current processing window else median is replaced else if condition fails the processed pixels is left unaltered. The filtering window is kept fixed at 3x3 for increasing noise densities. The proposed algorithm shows good results quantitatively and qualitatively when compared to existing and recent filters. The proposed algorithm is tested against different grayscale images and it gives higher Peak Signal-to-Noise Ratio (PSNR), low Mean square error (MSE) and good Image Enhancement Factor (IEF) with edge preservation capabilities even at very high noise densities. The proposed Algorithm is non adaptive and can replace several individual algorithms for the removal of different image artifacts such as blotches, black band noise, streaks.

Keywords: Unsymmetrical trimmed midpoint filter; Threshold, Impulse noise; blotches; black band noise.

1. INTRODUCTION

During the process of sampling, transmission and receiving of the data more frequently results in distortion. There are two types of noises that occur in nature due to the above said reasons, the Gaussian additive and the impulse noise. Gaussian noise removal can be effectively done by linear filtering methods. Due to Impulse noise some of the pixels in the image get destroyed by taking white and black spots. Median filters are class of non linear filters that eliminates impulse noise by preserving the edges of the image [1]. In satellite image acquisition of images such as remote sensing, along with impulse noise some artifacts such as blotches, drop lines, strip lines, band missing gets induced in the image. Blotches are impulsive type degradations that are randomly distributed over the image with irregular shapes of at most same intensities. These blotches occur in old images due to wrapping of the image for a long time or by dust, dirt. When a detector does not work properly over a little time the drop lines are induced. In case of occurrence of two or more drop/strip lines occur continuously then band missing artifact gets added to the image. But it is considered to be a serious problem. Due to the film material running against an object in a data acquiring equipment scratches occurs in images [2], [5]. For image sequences, strip lines and drop lines were considered as line scratches in Silva et al method. Bright scratches are found in positive type film and Dark scratches are found in negative films. Silva et al method gives the solution for the removal of line scratches and blotches in images. The blotches were modeled as impulsive with uniform intensities having disguised in irregular shapes [3]. The method of removing scratches and restoring missing data based on temporal filtering was given by kokaram [4]. This paper is organized as follows. Section II describes Existing Filters and its flaws. Section III gives an overview of related work on Image De-noising using proposed algorithm Section IV deals with Exhaustive Experimental Results and Discussions and finally Concluding Remarks are given in Section V.

2. EXISTING FILTERS AND ITS FLAWS

Over the recent years various numbers of median filters have been proposed for the reduction of impulse noise. The renowned median filter variants such as simple median filter, threshold decomposition filter, center weighted median filter, Rank order filters etc, These filters works effectively until the impulse Noise density is low, also these filters operate on the entire image irrespective whether the pixel is noisy or not. This causes the image to be unfiltered for higher noise densities and also it consumes lot of time [16]-[17]. The size of the window plays a vital role in impulse noise removal. Small window size would not provide sufficient information for impulse noise removal rather increasing the window size would blur the image. Hence a suitable window size should also be properly chosen. These problems were rectified by decision based algorithm which operates only on the corrupted pixels [14]. These decision, switched, iterative or cascaded non linear filters are mostly adaptive or time consuming in nature (due to variable window size). Certain class of Decision based algorithm classifies the pixel as noisy using fixed threshold or uses local statistics (comparing the processed pixel with minimum and maximum value of the local window). Next comes the problem of Decision making to classify the pixels are noisy or not. In Detail preserving filter [6] the impulse noise is removed using a simple peak valley filter to remove impulse noise up to 50% but does not perform well for higher noise densities. In Lin et al [7] method uses difference between the absolute processed and average of pixels (leaving the processed pixels for calculating average) to estimate the given pixel is noisy or not. The algorithm works well in estimating the noise at lower noise densities but tend to flatter at higher noise densities. Progressive switched median filter [8] shows good noise removal characteristics for low and medium density impulse noises with increase in window size. The size of the window is varied from 3 or 5, also the procedure is iterative in nature. Decision based modified shear sorting algorithm [15] degrades the image quality at higher noise densities. Since the neighborhood value is used as a replacement for computed median being noisy, thereby resulting in streaks. The Chan & Nikolova method [18] removes the impulse noise using an adaptive and variational approach. The drawback of this method uses window size as 39 X 39 thereby increasing the computing complexity. S.Manikandan and Ebenezer method [19] used a 5 X 5 matrix window size but the method is adaptive and time consuming. S Md Roomi et al proposed a method [20] which uses an iterative based algorithm which requires large time for execution. The independence of the pixels in the image is lost at larger densities. In Shitong Wang et al [21] the minimum size of the window is recommended to be 7X7 or 9X9 even when noise density is small, when size increases the computation time also increases. The method proposed by Raymond H.Chan et al [22] works well in eliminating large grey patches of noisy pixels of density upto 50% but tends to flatter at higher noise densities. In all of these methods either the filtering algorithm is applied to the entire filter or the size of the mask increases with noise density or artifacts such as blotching is introduced as a result of filtering or performing the operation repeatedly results in loss of data independence [23]. So a suitable filter which is fast and capable of removing the impulse noise has to be formulated. The most straight forward solution to the entire above stated problem is to use a fixed sized window and to employ decision that retrieves image even from high density noises and its artifact. The proposed algorithm uses simple non adaptive switched method to restore images even at higher noise densities with fixed sized 3x3 window [23]. For comparison, five existing algorithm was considered. Of which two are based on fixed threshold [7], third algorithm is DPA [6], fourth algorithm is PSM [8], and fifth one is MSSD [15]. The threshold based algorithms used modified decomposition filter [11]-[13] for ordering data in decreasing order.

3. PROPOSED ALGORITHM

The brief illustration of the proposed algorithm is as follows.

Step 1: Choose 2-D window of size 3x3. The processed pixel in current window is assumed as p_{xy}.

Step 2: sort the 2D window data in ascending order using snake like modified shear sorting which is given by S. now Convert sorted 2D array into 1D array. S_{med} is the median of the sorted array

Step 3: **Unsymmetrical trimmed Midpoint filter**

Initialize two counters, forward counter (F) and reverse counter (L) with 1 and 9 respectively. When a 0 or 255 are encountered inside the Sorted array (S), F is incremented by 1 or L is decremented by 1 respectively. The resulting array will be holding non noisy pixels of the current window. The midpoint of this array is termed as UTMP (unsymmetrical trimmed midpoint) .

Step 4: **Salt and pepper noise Detection using UTMPF**

Case (1): If the absolute difference between the processed pixel and unsymmetrical trimmed midpoint filter (UTMP) is greater than the fixed threshold (T) then pixel is considered as noisy. As illustrated in equation1

$$\text{If } \left| P(x,y) - UTMP \right| > T \qquad (1)$$

Case (2): If the case 1 is true find the absolute difference between the median of and unsymmetrical trimmed midpoint filter (UTMP). Check the difference is greater than the fixed threshold (T1) then median is considered as noisy as illustrated in equation 2.Case 2 is done for high noise densities where the computed median is also noisy.

If $|S_{med}\text{-UTMP}| > T1$ (2)

Step 4: **Salt and pepper noise Correction logic**

If the case1 $|P(x,y)\text{-UTMP}| > T$ is true then check for the second case2 $|S_{med}\text{-UTMP}| > T1$. If both the condition are true then processed pixel and computed median is noisy. Hence replace the corrupted pixel with median of Unsymmetrical trimmed midpoint. If condition 1 is true and condition 2 is false then corrupted pixel is replaced with the median of the sorted array. If both case 1 and case 2 fails then the pixel is termed as non noisy. The pixel is left unaltered [24].

3.1 Methodology of proposed work

The bigger matrix refers to image and values enclosed inside a rectangle is considered to be the current processing window. The element encircled refers to processed pixel. The above discussed methodology is illustrated as below.

$$\begin{pmatrix} 0 & 0 & 255 & 0 & 255 \\ 94 & 177 & 205 & 155 & 255 \\ 0 & 0 & 255 & 25 & 123 \\ 0 & 0 & 187 & 124 & 255 \\ 0 & 255 & 255 & 255 & 255 \end{pmatrix} \quad \begin{pmatrix} 0 & 0 & 255 & 0 & 255 \\ 94 & 177 & 205 & 155 & 255 \\ 0 & 0 & 115 & 25 & 123 \\ 0 & 0 & 187 & 124 & 255 \\ 0 & 255 & 255 & 255 & 255 \end{pmatrix}$$

Corrupted image Segment Restored image Segment

Case (a): Initialize forward counter F=1 and reverse counter L=9. Convert the 2D array into 1D array and sort the converted array. F and L counter moves in forward and reverse directions respectively. When a 0 is detected F is incremented by 1 and when a 255 is detected L is decremented by 1.

Unsorted array: 177 0 0 205 255 187 155 25 124

Sorted array Sxy 0 0 25 124 155 177 187 205 255

Here the median Smed value is 155. The case (1) is illustrated as follows. Now check for the presence of 0 or 255 in the sorted array. Every time a 0 is detected F is incremented by 1 and if 255 is detected L is decremented by1. In the above example there is two 0 and one 255. Hence F is incremented by two times and L is decremented by one time. Now finally F is holding 3 and L is holding 8. Now the variable DET is assigned with the midpoint of the rank ordered unsymmetrical trimmed output i.e. corrupted pixel is replaced by Midpoint of the trimmed array i.e, (25+205)/5=115. i.e., DET=115. Now perform first step detection $|255-115| > 40$. This condition is true. The Second condition is checked $|155-115| > 20$ and the second condition is true. Hence the pixel and the computed median is considered as noisy. The corrupted pixel is replaced by midpoint of sorted array i.e., output =115.

$$\begin{pmatrix} 0 & 0 & 255 & 0 & 255 \\ 94 & 177 & 0 & 0 & 125 \\ 0 & 0 & 185 & 0 & 255 \\ 0 & 0 & 255 & 255 & 255 \\ 0 & 255 & 255 & 255 & 255 \end{pmatrix} \quad \begin{pmatrix} 0 & 0 & 255 & 0 & 255 \\ 94 & 177 & 0 & 0 & 125 \\ 0 & 0 & 185 & 130 & 255 \\ 0 & 0 & 255 & 255 & 255 \\ 0 & 255 & 255 & 255 & 255 \end{pmatrix}$$

Corrupted image Segment Restored image Segment

Case (b): Initialize forward counter F=1 and reverse counter

L=9. Convert the 2D array into 1D array and sort the converted array. When a 0 is detected F is incremented by 1 and when a 255 is detected L is decremented by 1.

Unsorted array: 0 185 255 0 0 255 125 255 255

Sorted array S_{xy} 0 0 0 125 130 255 255 255

Here the median Smed value is 130. The case (2) is illustrated as follows. Now check for the presence of 0 or 255 in the sorted array. Every time a 0 is detected F is incremented by 1 and if 255 is detected L is decremented by1. In the above example there is three 0 and three 255. Hence F is incremented by three times and L is decremented by three times. Now finally F is holding 4 and L is holding 6. Now the variable DET is assigned with the midpoint of the rank ordered unsymmetrical trimmed output i.e. (125+185)/2 = 127. i.e., DET=127. Now perform first step detection │0-127│ > 40. This condition is true. The Second condition is checked │130-127│ > 20 and the second condition is false. Hence the processed pixel is noisy and the computed median is considered as non noisy. Hence the corrupted pixel is replaced with median of the array i.e. 130 output=130.

$$\begin{pmatrix} 0 & 0 & 255 & 0 & 255 \\ 104 & 119 & 255 & 255 & 255 \\ 0 & 103 & 255 & 255 & 123 \\ 0 & 122 & 255 & 124 & 255 \\ 0 & 255 & 255 & 255 & 255 \end{pmatrix} \qquad \begin{pmatrix} 0 & 0 & 255 & 0 & 255 \\ 104 & 119 & 255 & 255 & 255 \\ 0 & 103 & 255 & 255 & 123 \\ 0 & 122 & 255 & 124 & 255 \\ 0 & 255 & 255 & 255 & 255 \end{pmatrix}$$

Corrupted image Segment Restored image Segment

Case (3):

Un sorted Array 0 104 0 0 119 103 255 255 255

Sorted Array 0 0 0 103 104 119 255 255 255

Initialize F=1 and L=9. After sorting the current window in ascending order, the counters propagate in the 1D array resulting in holding F=4 and L=6. DET will hold trimmed midpoint (103+109)/2=106 ie, DET=106. Now perform impulse detection │119-106│ > 40. This condition is false and hence processed pixel is considered as non noisy hence left unaltered.

4. Simulation results & Discussions

The Quantitative performance of the proposed algorithm is evaluated based on Peak signal to noise ratio (PSNR) ,Mean Square Error (MSE) and Image Enhancement Factor (IEF) which is given in equations 3,4,5 respectively.

$$\text{PSNR} = 10\log_{10}\left(\frac{255^2}{MSE}\right) \qquad (3)$$

$$\text{MSE} = \frac{\sum_i \sum_j (r_{ij} - x_{ij})2}{M \times N} \qquad (4)$$

$$\text{IEF} = \frac{\left(\sum_i \sum_j n_{ij} - r_{ij}\right)^2}{\left(\sum_i \sum_j x_{ij} - r_{ij}\right)^2} \qquad (5)$$

Where *r* refers to Original image, n gives the corrupted image *x* denotes restored image, M x N is the size of Processed image. The existing algorithms used for the comparison are SMF, AMF, CWF, TDF, PSMF, DPF, The qualitative performance of the proposed algorithm is tested on various images such as Lena, Cameraman, Baboon, Barbara, girl, pepper etc (Images are chosen as per the details of the image). Quantitative analysis is made by varying noise densities in steps of ten from 10% to 90% on low detail, medium detail and high detail images and comparisons are made in terms of PSNR and IEF.

Figure 2, 3, 4 illustrates the superior performance of the proposed algorithm over existing filters for the fixed value impulse noise suppression. It is clear that the proposed algorithm has very high peak signal to noise ratio, high image enhancement factor and low mean square error. From figure 5 the proposed algorithm is very effective in eliminating the blotches. The proposed algorithm fails to eliminate drop lines as shown in figure 6. From the figure 7 we understand that the proposed algorithm eliminates black band noise effectively but introduces grey streaks in the uniform regions of the noise and original pixels. The proposed algorithm fails to eliminate streaks as shown in figure 8. The proposed algorithm is good in eliminating a noisy mixture of 70% fixed impulse noise plus the entire artifact. It is found from the figure 9; the proposed algorithm is good in

TABLE I
Performance of various algorithms For Fixed valued Impulse noise at different noise densities for PSNR

Noise in %	**PSNR IN DB**						
	SMF	**AMF**	**CWF**	**TDF**	**PSM**	**DPF**	**PA**
10%	34.92	39.38	35.23	32.77	38.85	33.8	37.9
20%	30.3	36.93	28.13	27.84	33.41	27.5	35.3
30%	23.99	34.68	22.26	23.36	29.4	23.1	33.6
40%	19.02	32.27	17.85	19.01	25.45	19.7	32.4
50%	15.93	27.38	14.38	15.32	25.39	16.8	31.2
60%	12.36	21.66	11.74	12.42	21.27	14.5	30.3
70%	10.08	16.6	9.62	10.01	9.94	12.5	29.3
80%	8.15	12.79	7.97	8.10	8.1	10.7	28
90%	6.6	9.86	6.56	6.60	6.68	9.2	26

TABLE II
Performance of various algorithms Fixed valued Impulse noise at different noise densities FOR IEF

Noise in %	**IEF**						
	SMF	**AMF**	**CWF**	**TDF**	**PSM**	**DPF**	**PA**
10%	89	246.8	95.9	38.2	219.8	69.1	178.95
20%	61	281.3	37.2	25	124.9	32.4	194.21
30%	21.4	254.4	14.4	19.6	74.5	17.8	199.97
40%	9.1	192.9	6.9	9.2	40.1	10.7	198.45
50%	4.9	78.3	3.9	4.8	39.6	6.8	192.36
60%	2.9	25	2.5	2.9	19.1	4.8	187.86
70%	2.0	9.1	1.8	2	1.9	3.5	173.05
80%	1.4	4.3	1.4	1.4	1.4	2.7	145.36
90%	1.1	2.5	1.1	1.1	1.1	2.1	103.68

TABLE III
Performance of various algorithms Fixed valued Impulse noise at different noise densities FOR MSE

Noise in %	**MSE**						
	SMF	**AMF**	**CWF**	**TDF**	**PSM**	**DPF**	**PA**
10%	20	7	20	26	8	27	10
20%	60	13	102	105	29	114	19
30%	259	22	409	286	74	312	27
40%	814	38	1082	800	185	686	37
50%	1877	118	2367	1909	187	1355	48
60%	3776	443	4295	3732	484	1197	59
70%	6379	1421	7109	6450	600	3651	75
80%	9945	3413	10624	9843	1000	5408	101
90%	14179	6708	14513	13922	1396	7798	161

TABLE IV
Performance of various algorithms For Random valued Impulse NOISE AT different noise densities for PSNR

Noise in %	PSNR IN DB						
	SMF	AMF	CWF	TDF	PSM	DPF	PA
10%	19.27	21.4	35.96	29.85	36.04	28.23	19.4
20%	16.34	17.4	32.05	29.03	32.18	22.6	17.0
30%	14.66	15.32	27.8	27.14	28.86	19.55	15.9
40%	13.59	13.85	23.8	24.35	25.42	17.34	15.1
50%	12.8	12.76	20.76	21.36	22.46	15.62	14.6
60%	12.21	11.90	18.17	18.77	19.54	14.32	14.3
70%	11.8	11.36	16.2	16.72	17.28	13.1	14.0
80%	11.49	10.85	14.6	14.96	15.19	12.2	13.7
90%	11.16	11.33	13.28	13.52	13.51	11.33	13.4

TABLE V
Performance of various algorithms For Random valued Impulse noise at different noise densities FOR IEF

Noise in %	IEF						
	SMF	AMF	CWF	TDF	PSM	DPF	PA
10%	45.2	1.6529	52.6	135	47.92	7.96	1.0376
20%	46.8	1.3254	40.4	104	39.15	4.32	1.2064
30%	25.2	1.2185	22.3	62	27.4	3.22	1.3878
40%	14.6	1.1625	11.6	30	16.66	2.58	1.5557
50%	8.73	1.1329	7.2	14	10.52	2.18	1.7498
60%	5.59	1.1115	4.74	8.1	6.48	1.93	1.9343
70%	3.94	1.1465	3.51	5	4.46	1.72	2.1023
80%	3.05	1.1632	2.75	3	3.14	1.58	2.2602
90%	2.4	1.4647	2.28	2	2.41	1.46	2.3847

TABLE VI
Performance of various algorithms For Random valued Impulse noise at different noise densities FOR MSE

Noise in %	MSE						
	SMF	AMF	CWF	TDF	PSM	DPF	PA
10%	767	7	16	67	16	97	732
20%	1507	13	40	81	39	357	1286
30%	2200	22	107	125	84	719	1671
40%	2841	38	270	238	186	1197	1999
50%	3406	118	544	475	368	1782	2218
60%	3900	443	989	862	721	2402	2410
70%	4295	1421	1556	1322	1215	3178	2574
80%	4613	3413	2253	2072	1967	3911	2740
90%	4967	6708	3054	2882	2897	4781	2924

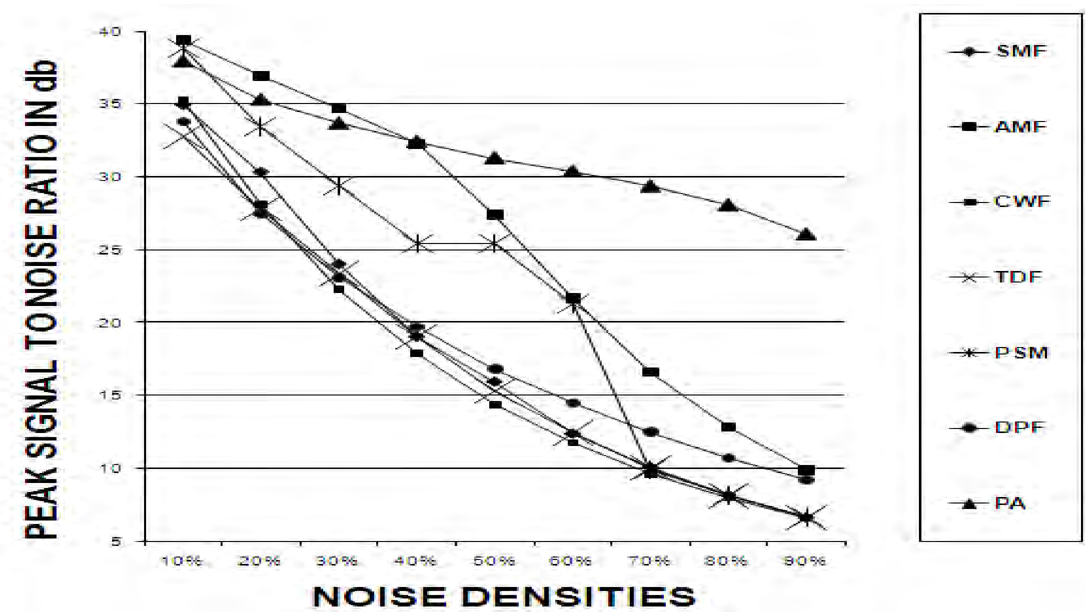


Figure 2. Performance comparison of PSNR at various noise densities for low detail Lena image in the presence of FVIN

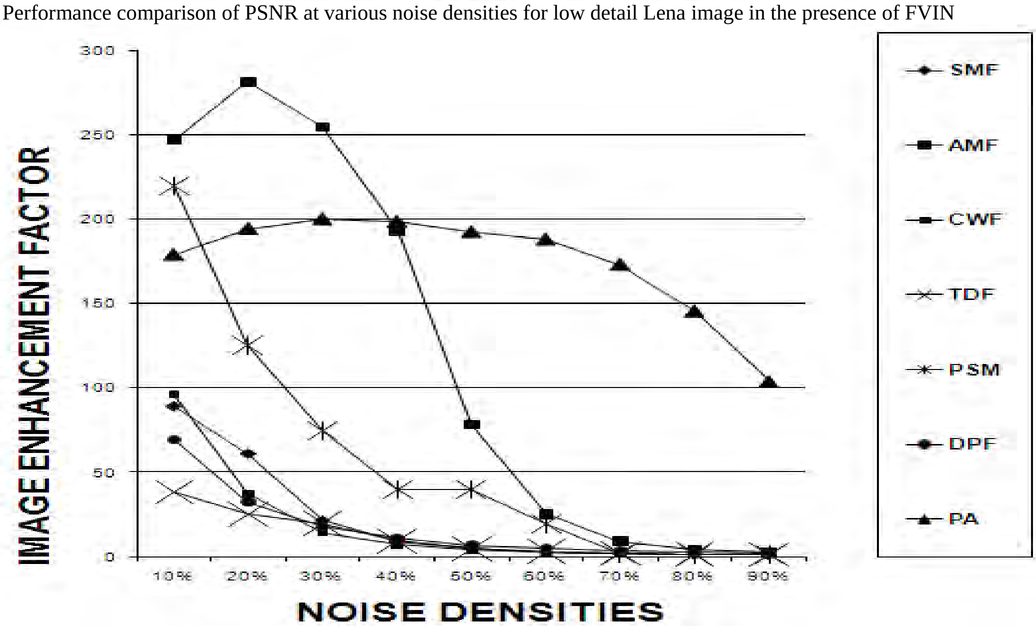


Figure 3. Performance comparison of IEF at various noise densities for low detail Lena image in the presence of FVIN

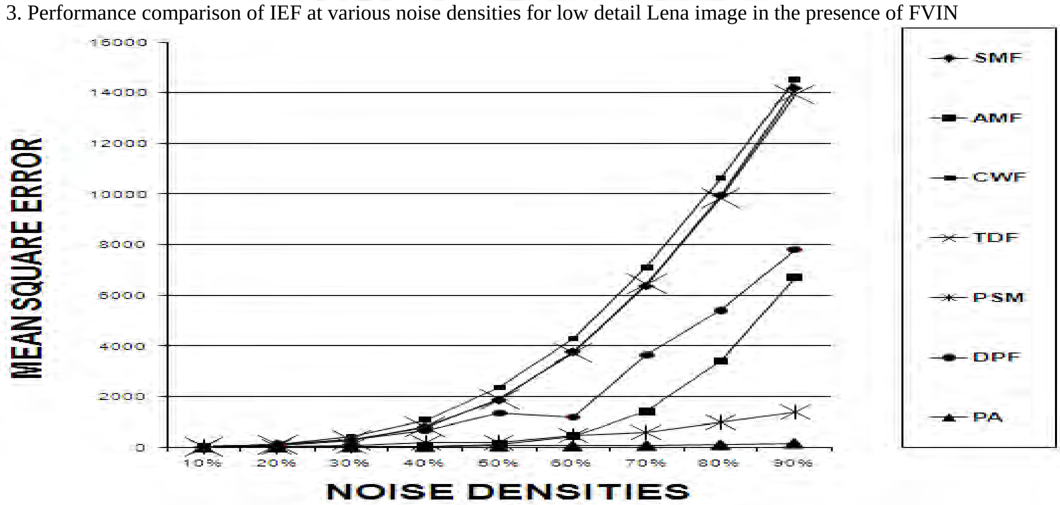


Figure 4. Performance comparison of MSE at various noise densities for low detail Lena image in the presence of FVIN

Figure 5 illustrates the performance of various filters over blotches From the left a) corrupted image b)SMF c) CWF d) TDF e)AMF f)PSMF g)DBA h)MDBUTMF i) PA.

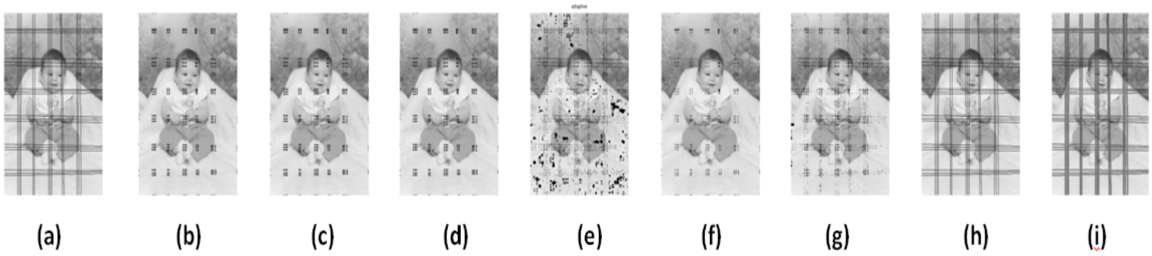


Figure 6 illustrates the performance of various filters over drop lines From the left a) corrupted image b)SMF c) CWF d) TDF e)AMF f)PSMF g)DBA h)MDBUTMF i) PA.

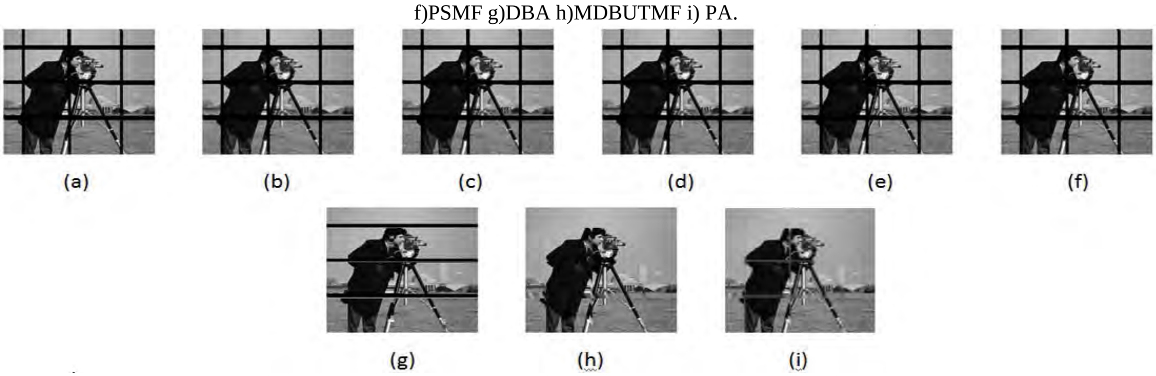


Figure 7 illustrates the performance of various filters over black band noise From the left a) corrupted image b) SMF c) CWF d) TDF e)AMF f)PSMF g)DBA h)MDBUTMF i) PA.

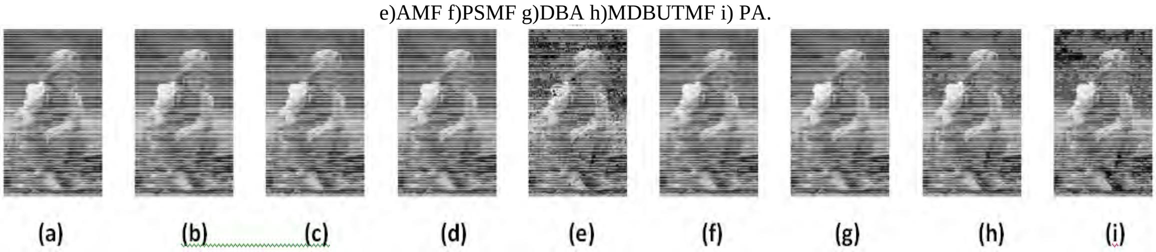


Figure 8 illustrates the performance of various filters over black band noise From the left a) corrupted image b) SMF c) CWF d) TDF e)AMF f)PSMF g)DBA h)MDBUTMF i) PA

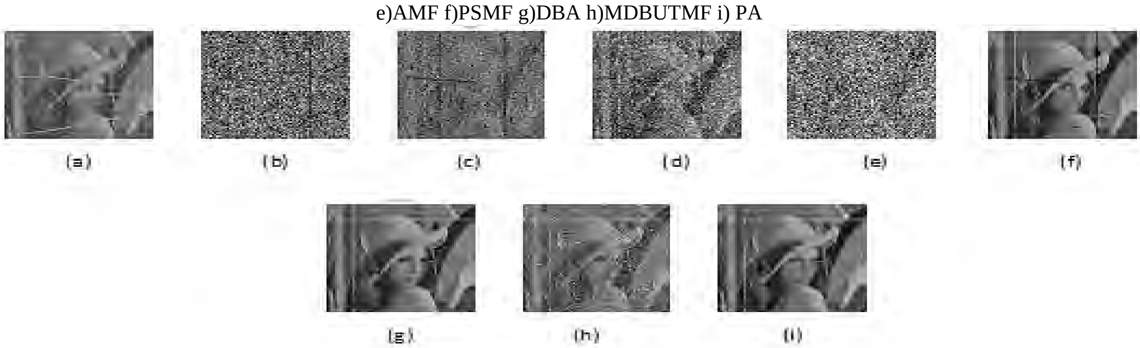


Figure 9 illustrates the performance of various filters over 70% fixed value impulse noise + STREAKS+STRIPES+BLOTCHES+BAND NOISE From the left a) corrupted image b) SMF c) AMF d) Meandet e) Meddet f)PSMF g)DBA h)DPF i) PA

TABLE VII
Performance of various algorithms at all degradation (70% fixed impulse noise + all degradations)

S.no	NAME OF THE FILTER	PSNR	MSE
1	SMF	9.84	6745
2	AMF	7.15	12533
3	PSMF	22.28	383.82
4	DPF	12.15	3958
5	CWF	9.63	7065
6	TDF	7.94	1342
7	MEANDET	9.97	6546
8	MEDDET	9.91	6628
9	Proposed Algorithm	22.47	367.69

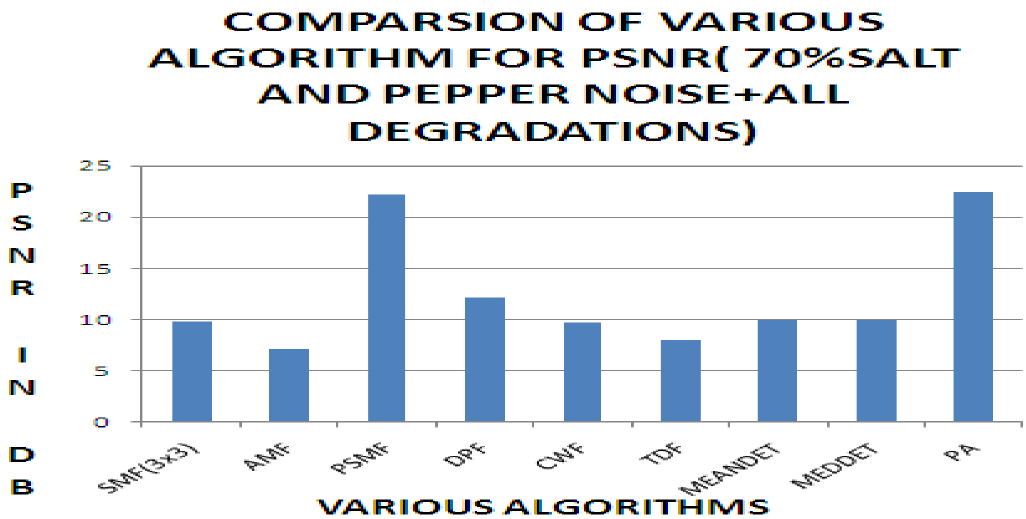


Figure 10. Performance comparison of PSNR at 70% noise densities plus all degradation for low detail Lena image

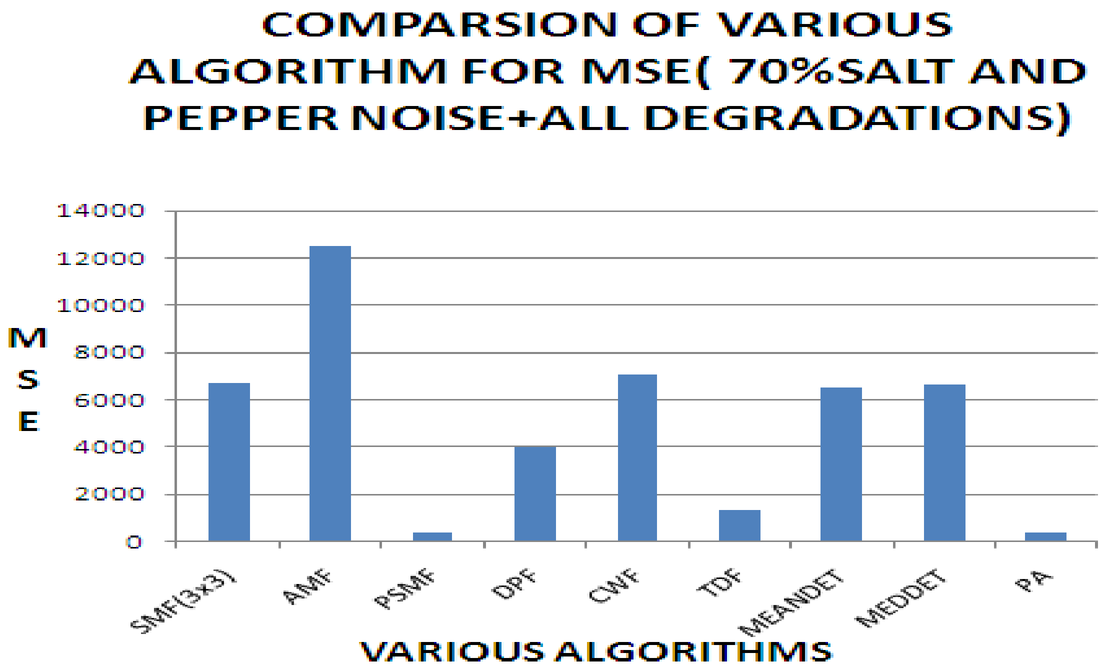
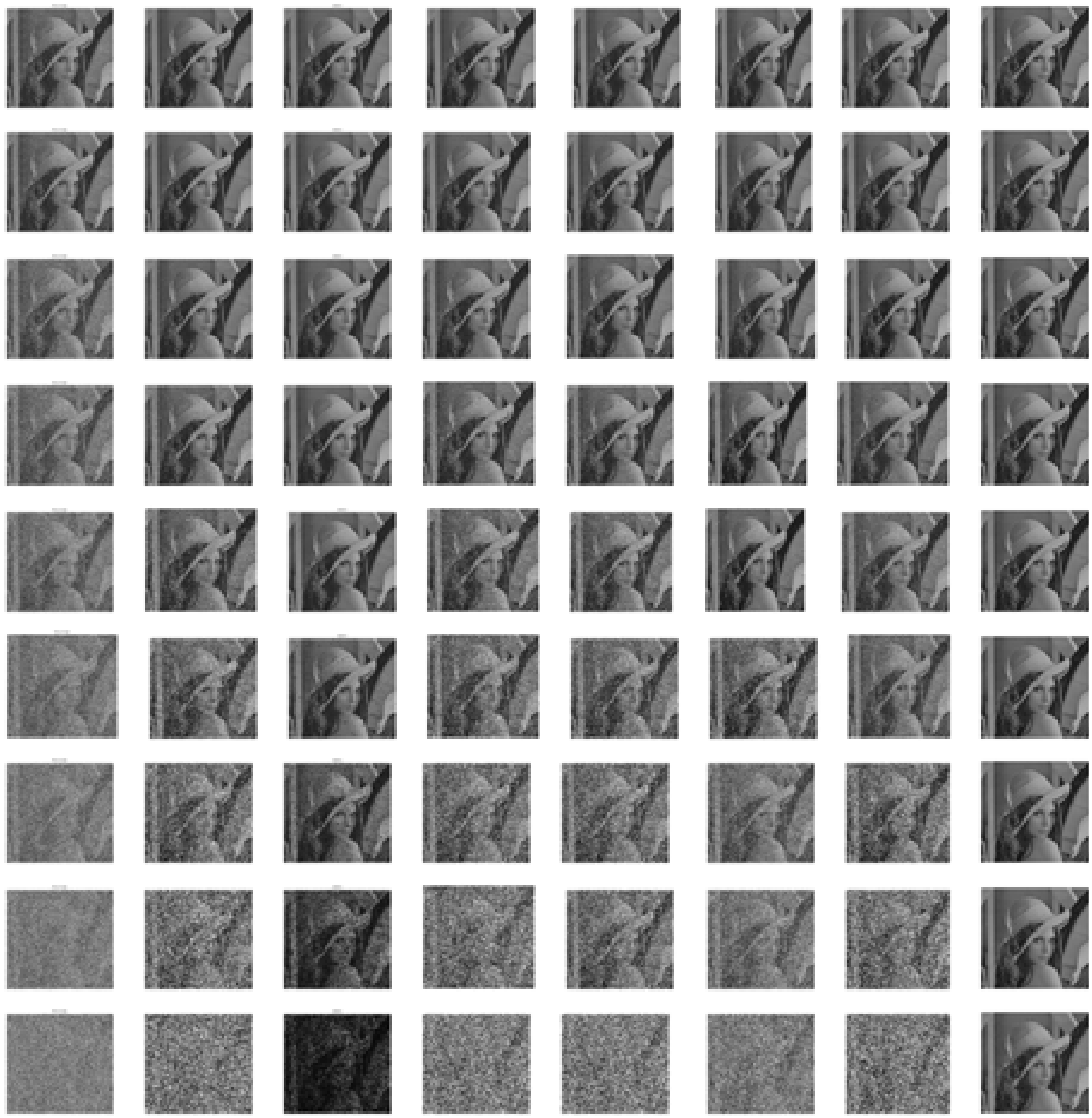


Figure 11. Performance comparison of MSE at 70% noise densities plus all degradation for low detail Lena image



(a) (b) (c) (d) (e) (f) (g) (h)

Figure 12. Performance of various filters for Lena image corrupted by Salt and pepper noise from 10% to 90% in row1 to 9 respectively. Output of various filters in column 1 to 8 (a) fixed value salt and pepper noise (b) output of SMF (c) output of AMF (d) output of PSMF (e) output of DPF (f) output of MEANDET (g) output of MEDDET (h) output of PA

(a) (b) (c) (d) (e) (f) (g) (h)

Figure 13. Performance of various filters for Lena image corrupted by Random Valued Impulse noise from 10% & 20% in row1 to 2 respectively. Output of various filters in column 1 to 8 (a) Random value salt and pepper noise (b) output of SMF (c) output of AMF (d) output of CWF (e) output of TDF (f) output of PSMF (g) output of DPF (h) output of PA

restoring images after corruption of the above said mixture. Figure 10 gives the performance of various algorithms for the reduction of 70% fixed value impulse noise plus all degradations. It is found that the proposed algorithm fairs well in eliminating the above noise mixture. Figure 11 illustrates the Mean Square Error performance of the proposed algorithm for elimination of 70% fixed valued impulse noise plus degradation. Figure 12 and 13 gives the qualitative performance of the proposed algorithm for various filters. It was found that the proposed algorithm eliminates the Salt and pepper noise effectively up to 70%.The proposed algorithm fails to eliminate random valued impulse noise even for low noise densities.

The quantitative results are summarized in tables 1 to 12 respectively. Table 1, 2 3 gives the quantitative performance of proposed algorithm with the other existing algorithm for the removal of fixed valued impulse noise. Even the quantitative results shows that the proposed algorithm is good at eliminating fixed valued impulse noise by holding a high PSNR, high IEF and low MSE. Tables 4,5,6 gives the performance of the proposed algorithm for Random valued impulse noise. The proposed algorithm fails to eliminate Random valued impulse noise at medium and high noise densities. Table 7 illustrates the performance of various algorithm for the reduction of 70% Fixed valued impulse noise plus all degradations. It was found from the numbers that the proposed algorithm has very good PSNR and low MSE.

5. CONCLUSION

This paper deals with a novel unsymmetrical trimmed midpoint acting as detector is proposed. The proposed algorithm is found to outclass other single level algorithms both quantitative and qualitatively. The proposed algorithm was good in eliminating fixed value impulse noise up to 70%, but introduces blurring at very high noise densities. The proposed algorithm eliminated random valued impulse noise for very low noise densities as low as 10%. The proposed algorithm also performs well in eliminating image artifacts such as blotches, black band noise and little extent of drop lines and streaks. The proposed algorithm uses fixed 3x3 window for increasing noise densities and hence non adaptive in nature. The proposed algorithm acts as a single algorithm which results in a good result for the reduction of impulse noises (both fixed and Random), image artifacts such as (blotches, block band noise, streaks and drop lines).

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