

BY USING MATLAB IMPROVISATION IN IMAGE QUALITY WITH HYBRID FILTERS

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Abstract— Images having different PSNR values. Through PSNR value we estimate the quality of image. In this paper image processing is done by using hybrid filter. The hybrid filter is a combination of two types of filter such as median filter and Weiner filter. Both filters are used for denoising image. The PSNR is evaluated and different.

Keywords— - Image processing, PSNR, Gaussian Noise, Salt and Pepper noise, Impluse noise detector, median filter, hybrid filter.

INTRODUCTION

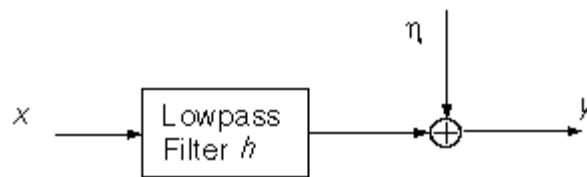
Image processing is in form of signal processing. Image is taking as input in image processing. The images such as photograph and video frame. The output of image processing in the form of image or a set of characteristics or parameters related to the image. Most of the image-processing techniques mostly used for the two dimensional processing and applying standard signal-processing techniques to it. Image processing not only applicable for digital signal processing but also for optical and analog image processing. The input image producing at first place is referred to as acquisition of image.

Image processing are correlated with computer graphics and computer vision. In computer graphics, real world objects are used such as environments, and lighting. They are being acquired from natural scenes, and mostly used in animated movies. Computer vision is considered as a high level image processing .A machine or computer software are used for decipher the content of physical objects.

The image restoration are basically used for undo the effect of a degraded image. Degradation of an image is done due to the motion blur, noise, and camera misfocus. In cases like motion blur, it is possible the actual blurring function come up with the very good estimate and they remove blur to restore the original image. In cases where the image is corrupted by noise, the degradation of an image is done. In this we used filters for denoising an image. Different types of filters are used for making image noise free.

Degradation Model

The block diagram for our general degradation model is



Where g represent corrupted image which is obtained by passing the original image f through a low pass filter (blurring function) b and adding noise to it.

Median filter

The median filter is used for removing noise from image. It is a nonlinear filtering technique such noise reduction is a typical pre-processing step which is to improve the results of later processing such as an edge detection of an image. Median filtering is used for digital image processing because it preserves edges while removing noise. It is generally used for removing 'salt and pepper' type noise. The median filter done at image through pixel by pixel, it replace the value of each pixel with the median of neighboring pixels. The pattern of image with.

1. Salt and pepper noise: It is a form of noise which is found on image. It generally represent white and black pixels. A "spike" or impulse noise give the result in the form of intensity values of random pixels to either their maximum or minimum values. The result obtained in form of black and white flecks in the image resemble salt and pepper. Due to error in data transmission this type of error caused. Salt and Pepper noise is consider as the impulse noise .This type of noise is generally created by the malfunctioning of the pixel elements in the camera sensors, faulty memory locations, or timing errors in the digitization process. The images corrupted by the impulse noise the noisy pixels can take only the maximum and the minimum values in the dynamic range.Salt and pepper noise will have the dark pixel value in dark region and the dark region will have the dark pixel

2. Gaussian noise: It is a type of statistical noise which have a probability density function .The value in noise known Gaussian-distributed. Gaussian noise is defined as the noise with a Gaussian amplitude distribution. Noise is taking as additive white Gaussian noise (AWGN), where all the image pixels derive from the Gaussian curve. The quantum fluctuations is generally caused by the lighter part of the image through the dominant noise. There are the variation in number of photons; this type of noise is called photon shot noise. Gaussian noise has a root-mean-square value proportional to the square root of the image intensity. The noises having different pixels are independent of each other.

neighbor pixel is called the window. It slides a pixel by pixel value of an entire image.



Original Image



with Median Filter

HYBRID FILTER

Hybrid Filter: The hybrid filter is improved version of adaptive wiener filter and adaptive median filter. This generally reduce white Gaussian noise and impulse noise respectively. The main purpose of hybrid filter is to remove Gaussian and impulse noise from digital images. While preserving thin lines and edges in the original image.

RELATED WORK

1. Er. Jyoti Rani, Assistant Professor, Dept. Of CSE, GZS PTU Campus, Bathinda, Punjab,
Er. Sarabjeet Kaur, Student of M.Tech, Dept. Of CSE, GZS PTU Campus, Bathinda, Punjab, India

This paper brief introduction of digital image processing is described. Mainly this paper is related to image restoration, different types of noises are introduced and different methods which are used to remove noise are described. Different parameters are also described to compare the results of different methods which are used. All the work is done on medical images.

2. Preeti Beniwal, Tarunjeet Singh

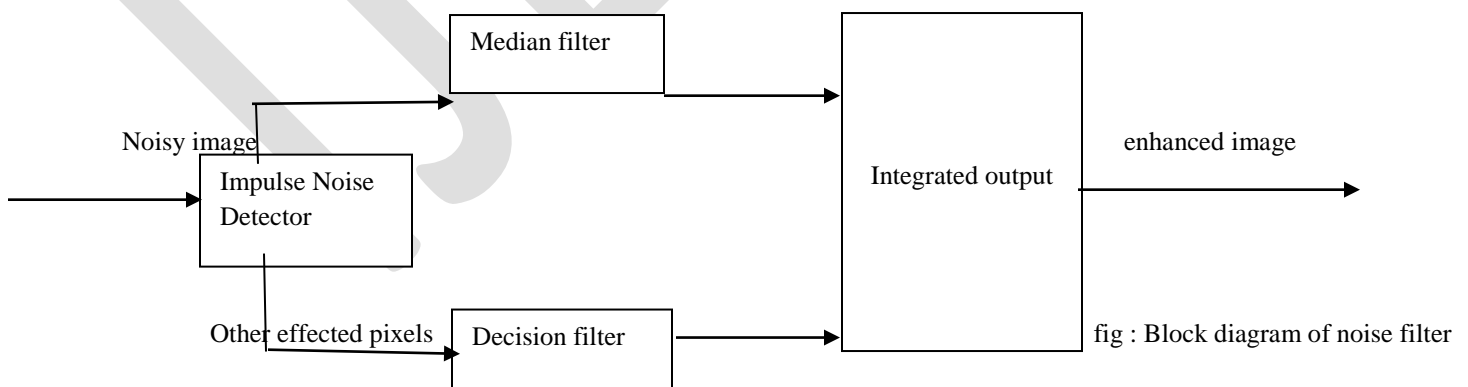
Department of Electronics & communication, Samalkha group of institution, Samalkha, Panipat,
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Image filtering processes are applied on images to remove the different types of noise that are either present in the image during capturing or introduced into the image during transmission. The salt & pepper (impulse) noise is the one type of noise which is occurred during transmission of the images or due to bit errors or dead pixels in the image contents. The images are blurred due to object movement or camera displacement when we capture the image. This pepper deals with removing the impulse noise and blurredness simultaneously from the images. The hybrid filter is a combination of wiener filter and median filter

3. Rekha Rani, Sukhbir Singh, Amit Malik

Image Processing is the vast area in the field of research. There are various techniques used to remove Present noise. This paper represents obstacles related with image during transmission. The salt & pepper noise, Gaussian noise, impulse noise, Rayleigh noise are the type of noise that are produced during transmission. Noise arises due to various factors like bit error rate, speed, dead pixels. The images become blurred due to camera movements, object movement or displacement of pixels. This paper deals with removal of combination of Gaussian noise, Rayleigh noise, impulse noise and blurredness, salt and pepper noise simultaneously from the image. The hybrid filter is such a tool that makes it successful to remove these noise form images and provide clarity to picture while preserving its details.

Proposed Work / Research Methodology



Impulse noise detector- Impulse noise detector detect the impulse noises in an image. These can be come through atmospheric disturbance.

Median filter- Median filter is a simple rank selection filter that output the median of the pixels contained in its filtering window.

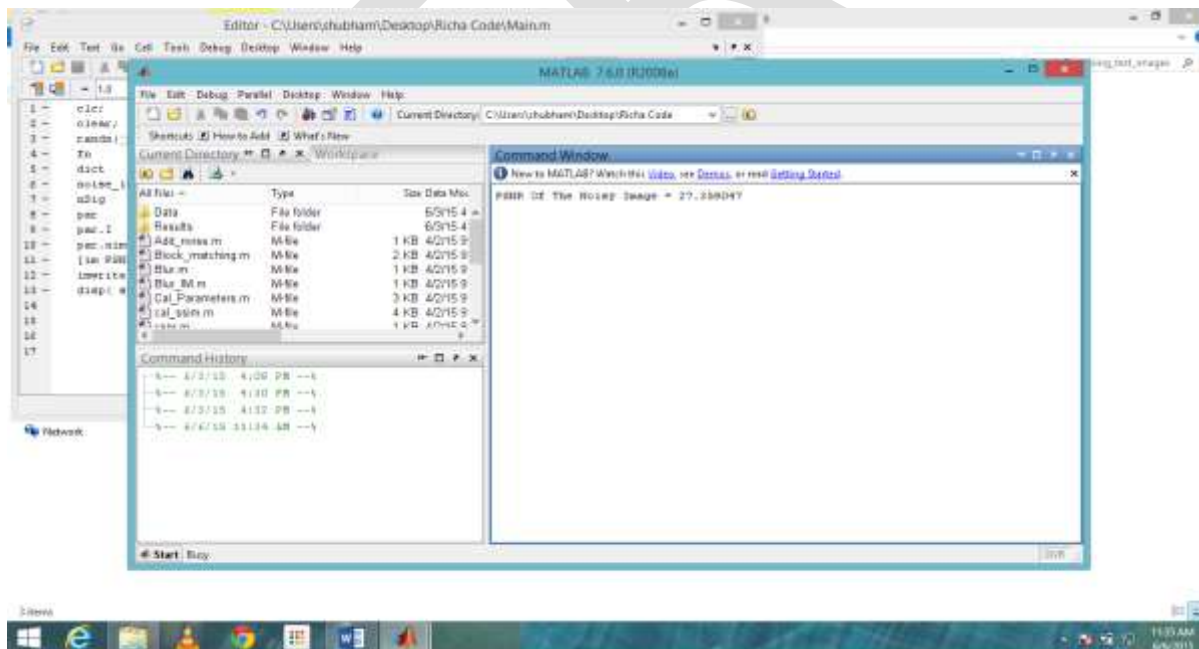
Decision filter- Decision filter overcome the remaining limitation of median filter.

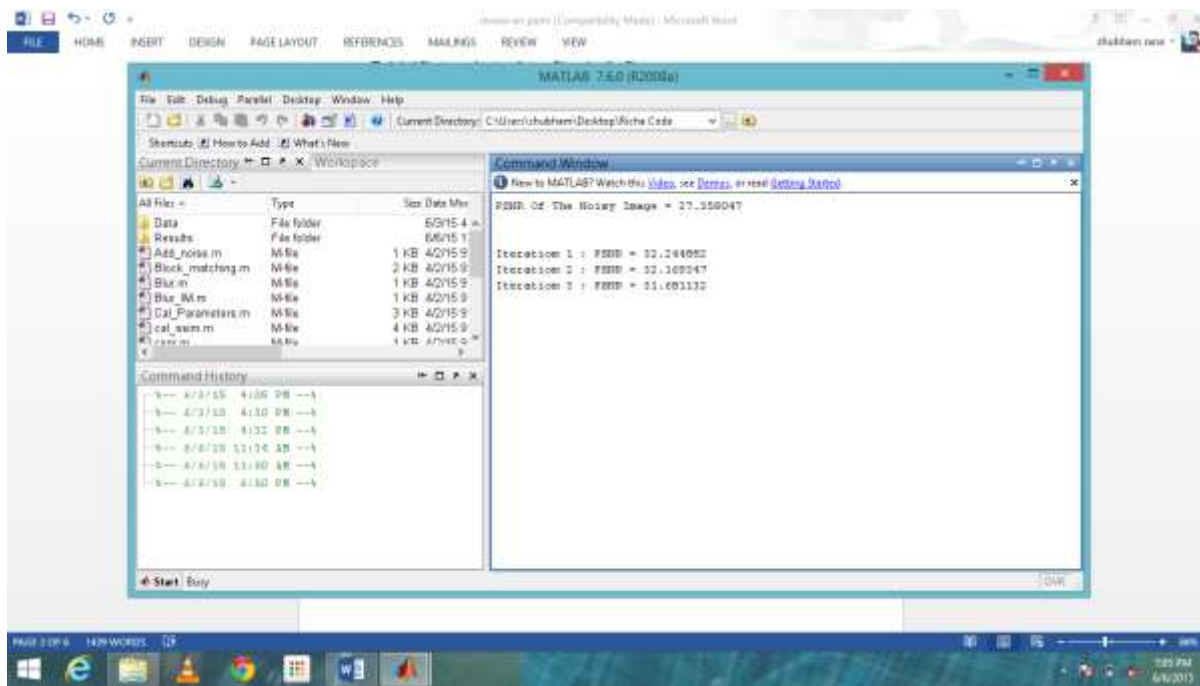
Integrated output- this show integration output of both filters and we got the MSE and PSNR value. Based on these result we got enhanced image.

RESULT



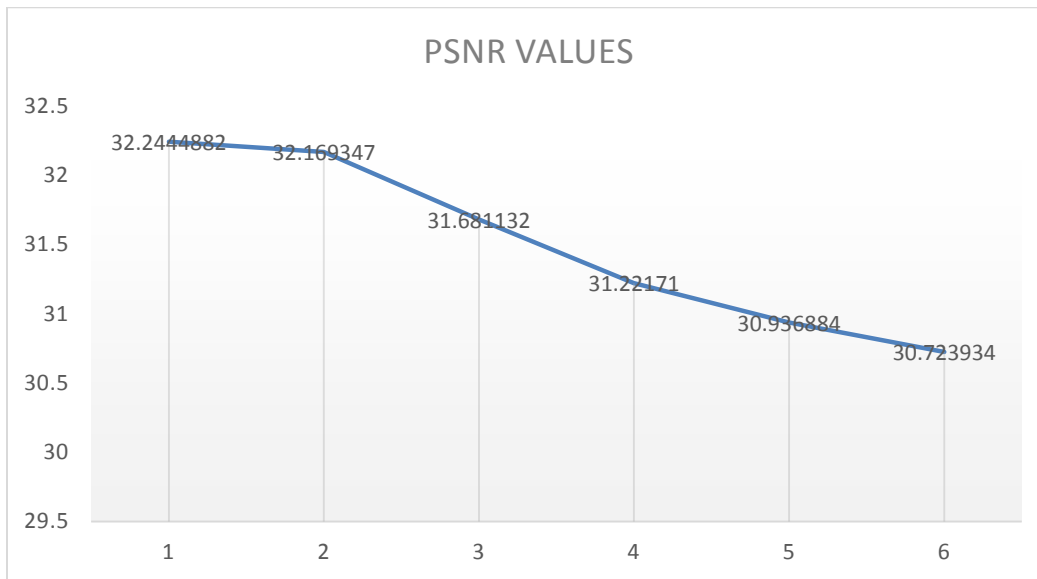
Original image with Peppers





After applying Iterations the image is noise free

ITERATIONS	PSNR VALUES
1	32.2444882
2	32.169347
3	31.681132
4	31.22171
5	30.936884
6	30.723934



CONCLUSION

Through this we conclude that the PSNR of noisy images are evaluated. With the help of Mat lab we calculate the PSNR of noisy images by applying iterations. It improves the quality of image through the use of hybrid filter. It makeIT improve the quality of image

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