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Lost of Pixel Recovery in Colored Images Using Neural Network

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Abstract-As we know pixels are lost in colored images due to misfocus of devices, damaged devices, environmental condition and noise. So it is better to have good algorithm to get good quality of image even after de noising that using some algorithm. Many researchers are doing work in this field to recover pixel lost in given RGB image. We are going to present a noble approach for pixel recovery using neural networks to get better result as we know mean and median filter sometimes did not work well with images. Neural networks works on hidden number of layers in that so we use better number of hidden layers to find pixel to its most matching intensity.

Keywords: **Colored images,** ***Neural Network, pixel recovery***

I. INRODUCTION

As we know images are blurred due to some imperfections added by defected instruments and problems during image acquisition process or transmission error. [1].Noise is also the main reason for the degradation of image.

Image restoration is the challenging problem in image processing. Image restoration means reconstructions of original image from the degraded and noisy image [2] Digital image restoration has received attention over last few years because of many applications that is has in images processing including removal of scratches, objects, text from digital image.

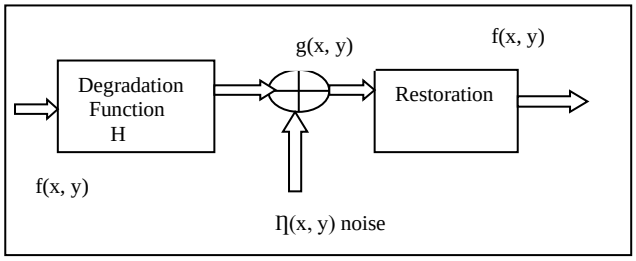

Fig1 Model of image degradation and restoration

If H is a linear position invariant process then the degraded image is given in spatial domain by g(x, y) =h(x, y)*f(x, y) +ὴ(x, y)

Where h(x, y) is the spatial representation of degradation function. Different techniques have been used for image restoration. A digital watermarking scheme can be visible or invisible. An invisible watermarking technique insertion step is represented as:

$X'=E_K$ (X,W) (2)

Where

X- Original image

W-Watermark information being embedded

K-user insertion key

E-watermark insertion function

X'-watermarked variant.

For oblivious watermarking techniques watermark extraction works as:-

$\hat{W}=D_{K'}(\hat{x}')$ (3)

$\hat{x}$ -possible corrupted watermarked image

$\acute{K}$-extraction key

D-watermark extraction/detection function

Ŵ-extracted watermark information

Mean filter is commonly used for restoration. it is usually measure b/w original a[m, n] and the estimate $\hat{a}$[m.n]:E{$\hat{a}\ [m,n]\ a[m,n]$}. Mean square error is defined by

$E\{\hat{a},a\}=\frac{1}{MN}\sum_{m=0}^{m-1}\sum_{n=0}^{n-1}|\hat{a}\ [m,n]-a[m,n]|^2$ (4)

Median filter is like mean filter but it is better in preserving sharp edges. It is like neighborhood pixels but not affects other pixels significantly, Mean filter does that. Median filter is used for paper and salt noise. Median in statistic mean the value of middle(5,6,7,8,9,3,3,2,9) 9 item so 5 is the median. Represented as

Many techniques and method have been used and also having different drawbacks. We review various techniques used and related work describe in section I. Problem formulation II. Proposed work is described in III section. Conclusion and Future work describe in VI section.

II. REVIEW OF TECHNIQUES AND RELEATED WORK

Many researchers have been done work in the recovery of lost pixels in images. Kuo-Chang Liu proposed [3] proposed Fragile watermarking for color images. Lie proposed the Idea of block wise watermarking scheme for color image. In the recovery the feature info of each block embedded into the color image is rebuilt for high quality recovery. The result shows that watermarking scheme can recover the tempered region with high quality. A fragile watermarking scheme based on the threshodling technique which proposed for wide variety of test color images. The idea is applied to color images for temper proffing and recovery. It gives best results and provides law complexity temper proffing method.

Irina Gladkova/Michael Grossberg/George Bonev and Fazel Shahriar[4] presented the extension of QIR(Quantitative image restoration) algorithm of aqua MODIS 1.6 micro band .This algorithm improves the performance and robustness using QIR algorithm damaged band can be restored. Error rate of QIR is also compared with previous work. They showed that it gave us high quality results. In his paper the restoration function QIR was based on multi-linear.

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Elhanan Elboher and Michael Werman [5] give the idea of recover the clipped information, presented the method that corrects the values of clipped pixel in bright image regions and also restores variation and color information which is defected by color clipping. This method works on raw data and also processed image.

Jia-Guu Leu 1995 IEEE [6] this paper uses the image smoothing method. In image smoothing to reduce the Gaussian noise and impulse noise we use window area. Window area is centre at the pixel. The pixels which are used for window area is divided into three groups based on their intensities. These three groups are: First group has higher intensity, second group has lower intensity and third group has intensity close to that of centre pixel. The new intensity for centre pixel is calculated for on the basis of three intensities. Number of pixels used to find the average, for different window different number of pixels is used for finding the averaging. Gaussian noise is more likely caused by sensor electronics. Impulse noise is caused by signal transmission. Both type of noise reduce the quality of an image. There are spatial domain and frequency domain techniques in smoothing an image. Spatial domain technique are faster to implement and easier to implement. One most commonly method used is neighborhood averaging, in which pixel intensity is replaced with an average intensity value computed from pixels within a window area centered at the pixel. This method is easy to implement and effective to remove Gaussian noise. It has drawback of edge and line blurring. To solve the problem of edge blurring there are a number of modifications on the basis of averaging. Impulse noise is removed by median filter .Here the intensity of centered pixel is replaced by median value of all neighboring areas. The image smoothing replaces both Gaussian and impulse noise .This technique based on the basis of rank filtering and pixel averaging

A. H. Taherinia, M. Fotouhi and M. Jamzad [7] this paper describes a new image restoration technique long range correlation used for damaging and destroying invisible watermarks. First some random nose is added to the watermarked image, after that use the restoration technique to restore the destroyed pixels. Watermarking technology has emerged as a solution for authorship proofs or dispute resolving. In these applications, there are several requirements that watermarking schemes must fulfill, like imperceptibility, robustness to attacks that try to erase a legally inserted watermark or to embed an illegal watermark in some asset.

E. Ardizzone H. Dindo G. Mazzola [8] this paper describes the new approach for solving the problem of restoration of grayscale textured images. The main purpose is to recover missing data of damaged area. First of all an image is decompose into bit-planes and then process bits rather the pixels. Filling-in gaps in a digital image, often known as digital inpainting, is one of the most active fields in image processing research. Restoration of damaged or unknown areas in an image is an important topic for applications as: image coding (e.g. recovering lost blocks); removal of unwanted objects (e.g. scratches, spots, superimposed text, logos); video special effects; 3D texture mapping. There are two different main approaches for a filling-in problem in literature: PDE (Partial Differential Equation) methods, and constrained texture synthesis. Texture synthesis methods reconstruct an image from a sample texture. For inpainting purposes, region to fill-in is the area into which synthesize the texture, and information to replicate is taken from the surrounding pixels.

Irina Gladkonva, Michael D.Grossberg, Fazlul Shahriar, George Bonev and Peter Romanov [9] they describe a QIR (quantitative image restoration) algorithm which is used to accurately estimate and restore the data lost due to multiple detector failure. They also compared his results with other researcher work. Prior work has treated band 6as a function of band 7.Their calculations shows that their results outperform previous result which were based purely on band 7.They also verified error rates of QIR algorithm on the granules.QIR algorithm which uses neighboring pixels used to compare with the prior work. But there is also problem using with QIR that there are some scattered pixels in the good bands with missing or out of valid range values.

III. PROBLEM FORMULATION

The technique proposed in this paper is noble approach in neural network for increasing the accuracy of colored images. The technique provide better results compared to leading techniques like interpolation and QIR(quantitative image restoration. the problem with interpolation is that interpolation results in artifacts due to the significant data loss and it sometimes even fills pixels with statistically or physically invalid image values. The QIR improves the error rate on granules as compared to prior work but yet not removed completely.

IV. PROPOSED WORK

We will use noble approach of neural network for lost of pixel recovery. The neural network work on hidden layers. There may be one or more than one hidden layers in neural network.

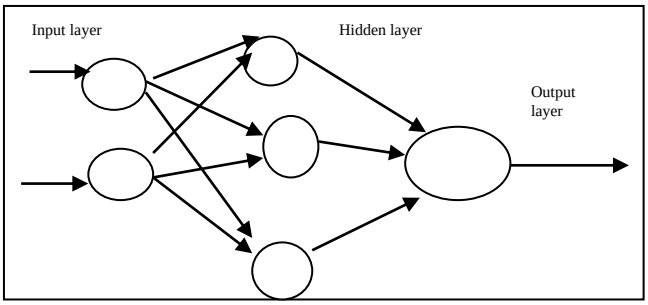

Fig 2 neural network

V. CONCLUSION AND FUTURE WORK

After reviewing of different techniques we find that the problem of lost of pixel is not recover completely. Different techniques have different drawback and does not give accurate result. The problem of Using mean and median filter is that image losses its sharpness and edges are minimally degraded. When we Using QIR technique it does not give satisfactory result. So, we use Nobel approach of Neural Network for better result. In future work we will design, and implement the method.

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REFERENCES

1. Yazeed A.Al-Sbou Artifical neural network evaluation as an image denoising tool 2012 IDOSI Publications
2. Charu Khare and Kapil Nagwanshi Image restoration with non filter vol.39 February 2012
3. Kuo-Chang Liu Fragie water marking for color images using thersholding technique world academy of science, engineering and technology 68, 2012
4. Irana Gladkova ,Michael Grossberg,George Bonev and Fazel Shahriar A multi-band statistical restoration of the aqua modis 1.6 micro band proc.spie,vol.8048,p.804819,2011
5. Elhanan Elboher and Michael Werman Recovering color and details of clipped image region
6. Jia-Guu Leu Image smoothing based on pixel grouping 1995 IEEE
7. A. H. Taherinia, M. Fotouhi and M. Jamzad "A New Watermarking Attack Using Long-Range Correlation Image Restoration
8. E. Ardizzone H. Dindo G. Mazzola Texture Synthesis for Digital Restoration in the Bit-Plane Representation
9. Irina Gladkonva, Michael D.Grossberg, Fazlul Shahriar, George Bonev and Peter Romanov Quantitative restoration for modis 6 on aqua IEEE june 2012

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Tejinder Thind is Asst. Prof. of lovely professional University, Jalandhar. He has received his MCA degree From GNDU,Amritsar in 2001and M.Tech(IT) degree From Punjabi university,Patiala in 2004. In his research area he has published two international and one national paper.

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