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Enhancement of Color Image in RGB Space

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***Abstract*-Image can be contained with different types of noise for different reasons. The purpose of system is,removing noise from data is often the first step in data analysis. De-noising technique should not be only reduce the noise, but do so without blurring or changing the location of the edges.In this study, it is shown that the capability of the PDE-based approaches depends highly on the neighboring structure. In this work, proposed system will remove the visually annoying parts of the noise which disturbs the original image.Image quality will be improved without altering colors in original color vectors by adding any false image by using DWT algorithm and non-linear median filter method.**

***Keywords*- Image, Noise, Pixel Intensity, Filter, DWT Algorithm.**

I.INTRODUCTION

Noise can be occurred because of the circumstance of recording such as electronic noise in cameras, dust in front of lens, because of the circumstance of transmission damaged data or because of storage, copying and scanning etc. or intentionally added noise by attacker in forger image for making detection difficult. So images need to be filtered for noise removal."Enhancement of Color Images in RGB Space" where 'Enhancement' means an increase in quality of Color Images ,'Image' is collection of pixels ,'RGB color model' is an additive color model in which red, green and blue colors are added together to form a broad array of colors.

De-noising of image data has been an active area of research with several different approaches being proposed using techniques such as diffusion method, shock filter method etc. In this work we followed terminology used partial differential equation literature where non-linear median was defined. In this paper, we consider the colored noisy or blurred images where the diffusivity is a tensor varying with both the location of pixel in the image and the orientation of the local image geometry around the pixel. This allows us to smooth the image in the direction of an edge.

This paper is organized as follows. In section 2, we introduce the idea behind the discrete wavelet transform algorithm and discuss the median filter. In section 3, we also introduce the color constancy of the image. In section 4, we describe the advantages and in section 5, we describe disadvantages of proposed system. In section 6, we describe application of this work. Finally, we conclude with brief summary of our work.

II.LITERATURE SURVEY

A. DWT ALGORITHM

Discrete wavelet transform is the standard methodused for image compression.

In this algorithm converting of colored image into gray scaled image will be done. Propose system will use DWT to describe local changes in brightness of that image and also convert colored image into gray scale image [8].

In DWT method we can manipulate all kinds of images. EspeciallyDWT use for JPEG format image but here we can use DWT for all kinds of image format.

Fig. 1 Original image of Flag

Fig. 2 Converted gray-scaled image of flag

B. *FILTERING*

In image processing filters are mainly used to suppress either the high frequencies in the image that is smoothing the image, or the low frequencies, that is enhancing or detecting edges in the image [2].

A filter is a process that removes from a signal some unwanted component or feature. Filtering is a class of signal processing, the defining feature of filters being the complete or partial suppression of some aspectof the signal. Most often, this means removing some frequencies and not others in order to suppress interfering signals and reduce back ground noise. However, filters do not exclusively act in the frequency domain, especially in the field of image processing many other targets for filtering exist [1].

C. *MEDIAN FILTERING*

The median filtering is non-linear filtering technique which is used to remove noise. Median filtering is used in digital image processing. It often used in certain conditions. It preserves edges while removing noise[4].

The idea of median filter is to run through the signal entry by entry. It replaces each entry with median of neighboring entries. The pattern of neighbored is called window which slides entry by entry over the entire signal. For single dimensional signal, the most obvious window is just first few preceding entries whereas for two dimensional signals such as images more complex window pattern are possible such as box or cross patterns [6].

If window has an odd number of entries then median is simple to define, it is just middle value after all the entries in the window are sorted numerically. For even number of entries there is more than one possible median. The average value of middle two entries is median of that window.

For example, we take simple 1D signal,

X=[2 10 5 3]

The median filtered output Y is,

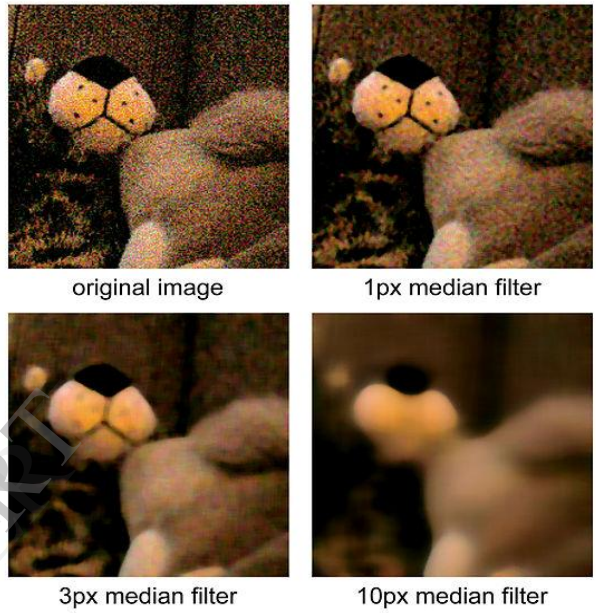
Y [1] = [2 2 10] = median [2 2 10] = 2

Y [2] = [2 10 3] = median [2 3 10] = 3

Y [3] = [10 5 3] = median [3 5 10] = 5

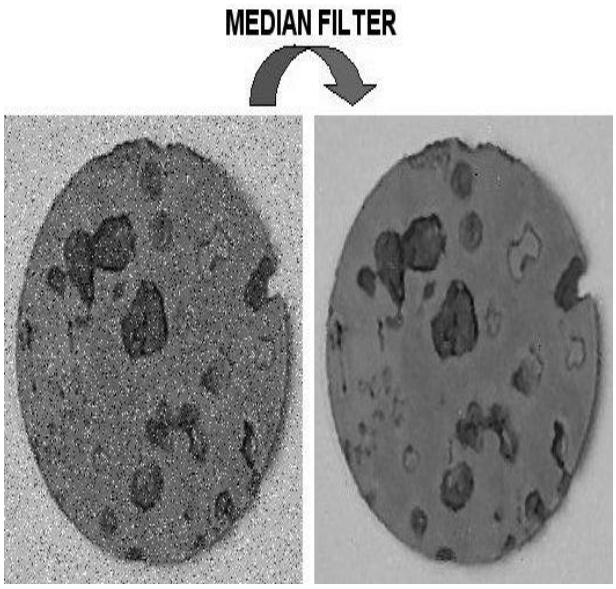
Y [4] = [5 3 3] = median [3 3 5] = 3

i.e. Y = [2 3 5 3]



Source: Internet.

Fig a. Example of 3 median filters of varying radii applied to the same noisy photograph implemented in AdobePhotoshop.



Source: Internet

Fig. b Example of Median filtering

D. PIXEL

A pixel is the smallest addressable element of an image. Pixels are normally arranged in 2D, and are often represented using dots or squares. Each pixel is a sample of an original image, where more samples typically provide more-accurate representations of the original [8].

In this algorithm, we will divide the overlapping block pixels into matrix and then sort the matrix, finally increase the intensity value of each pixel.

III.COLOR CONSTANCY

RGB color model is an additive color model in which Red, Green and blue colors are added together to form a broad array of colors. A great feature of our visual system is that we can perceive the color of an object rather the same way under different color lights, in other word, human visual system is color constant [2].

Color constancy is a branch of the computer vision which deals with effects of the color of an illuminant on the appearance of the objects seen under that illuminant. The aim of color constancy is to compensate for skews brought about by the color of the illuminant on the color of the objects in the images [2].

IV.ADVANTAGES

- The propose system will use to remove the noise form the image in such a way that the original image is discernible.
- The system enhance the image quality
- Image quality will be improved without altering any colors in original colors vector by adding any false image.

V.DISADVANTAGES

- It is difficult to treat analytically the effect of this filter.
- Repeating will remove noise but at the expense of detail where pixel brightness values are leveled across regions.
- Perform moderately in removing random-intensity noise.

VI.APPLICATION

A. Image Enhancement

It refers to sharpening or clarification of image features such as boundaries of contrast to make graphics display more useful for display and analysis. This process does not increase the inherent information content in data. It includes gray level and contrast manipulation, noise reduction, edge sharpening, filtering, interpolation and magnification and so on.

B. Image Restoration

It is concerned with minimization of the effect of degradation while filtering of observed image. Effectiveness of image restoration depends on the extent and accuracy of the knowledge of degradation process as well as on filter design. Image restoration differed from image enhancement in that latter is concerned with more extraction or accentuation of image feature [11].

Partial differential equation (PDE) techniques have been widely applied over the last decade in image processing and they have been mainly devoted in image enhancement. The PDE-based formalism enables to regularize an image through successive iterations. The most interesting PDE based approaches are those using a non-linear diffusion filtering since it overcomes the limitation of linear methods [1] leading to isotropic smoothing [8]. Application of work include on the images arising from various imaging domains such as medical images, simple digital images, microscopic images and astronomical images.

CONCLUSIONS

As a conclusion, our proposed filter tends to reduce noise, improve useful information and enhance edge continuity simultaneously. These operations are interesting in processing mainly noisy images. It is based on the combination of the DWT algorithm and non-linear median filter and inherits their respective interesting properties. They improve the legibility as well as the visual quality of the image. Using this algorithm and filter we tend to clarify the image with improvement in its quality as well as sharpening the image.

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