

A REVIEW ON IMAGE ENHANCEMENT BY GEOMETRIC ADAPTIVE SHARPENING ALGORITHM

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ABSTARCT:

In modern science and technology, digital images gaining popularity due to increasing requirement in many fields like medical research, astronomy, remote sensing, graphical use etc. Therefore, the quality of images matters in such fields. But There are number of factors that are responsible for blurring in image like shaky camera or motion blur, atmospheric reasons, motion between camera and original image and worst focus camera, On the other hand, the image is dark and noisy if it is taken with a short exposure time but with a high camera gain. The quality of images can be improved by many ways. Image enhancement is one of the emerging methodologies among various existing techniques. Image enhancement is the process of simply obtaining an estimated original image from the blurred & strongly noisy image. The primary goal of the image enhancement is the original image is recovered from blurred & strongly noisy image .This paper contains the review of many different schemes of image enhancement.

Keywords: Image Processing, image Sharpening, denoising, blur or noisy image, GLAS algorithm.

1. INTRODUCTION

Image processing is an emerging field of practical study of images [1]. In this area image can analyze in order to enhance the quality, decrease the size and if the image is distorted than restore the image. Image enhancement is a process of recovering an original image from the observed image that can be blurred or corrupted strongly noisy image. The basic idea of image enhancement is obtaining an image that is free from blur and noise from the observed image in order to improve the image quality. There are number of factors that are responsible for blurring in image like shaky camera or motion blur, atmospheric reasons, motion between camera and original image and bad focus camera[2]. When the intensity of an observed point image is spread over the several pixels, image goes blurred or a flat color image occurs.

Image enhancement is to improve the interpretability or perception of information in images to provide better input for other image processing steps. The image acquired from natural environment with high dynamic range includes both dark and bright regions. image are difficult to perceive by human eyes, because to exceed in dynamic range of human eyes sensing Image enhancement is a common approach to improve the quality of those images in terms of human visual perception.

The enhancement methods can broadly be divided in to the following two categories:

- Spatial domain
- Transform domain

Large number of techniques have been focused on the enhancement of gray level images in the spatial domain. In spatial domain techniques [3], we directly deal with the image pixels. In spatial domain for getting desired output the pixel values are manipulated. The idea of blurring an image by reducing its high frequency components or sharpening an image by increasing the magnitude of its high frequency components is intuitively easy to understand. However, computationally, it is often more efficient to implement these operations as convolutions by small spatial filters in the spatial domain.

Image enhancement techniques in frequency domain are based on modifying the Fourier transform of an image. In frequency domain methods, the image is first transferred in to frequency domain. It means that, the Fourier Transform of the image is computed first. All the enhancement operations are performed on the Fourier transform of the image and then the Inverse Fourier transform is performed to get the resultant image [4].

The goal of image enhancement techniques is to improve a quality of an image such that enhanced image is better than the original image. Several image enhancement techniques have been proposed in both spatial and transform domains. Image enhancement is one of the most important issues in low-level image processing. Its purpose is to improve the quality of low contrast images, i.e., to enlarge the intensity difference among objects and background.

2. HISTORY OF IMAGE ENHANCEMENT

From the review of related work and published literature, it is observed that many researchers have enhance or restore image by noisy image by using different technique like sharpening algorithm deblurred algorithm, image sharpening method. Researchers have undertaken different systems, processes or phenomena with regard to sharpening and enhancement of image, it attempted to find better result. Since in the real world today image enhancement and restoration is in very much in demand, from the careful study of reported work it is observed that very few researchers have taken a work for image enhancement by using image sharpening technology.

The new methodology presented the shortcomings of current MAP-based deconvolution algorithms, and show that the intrinsic contradiction between the data fitting term and the regularization term limits their performance in deconvolution methods. To alleviate this problem, they propose a new approach called geometric locally adaptive deblurring (GLAD). The key idea behind the proposed approach was that instead of approaching deconvolution with global image priors, by considering deblurring according to the local image structure. [5] In this way, they illustrate that deblurring and denoising can be efficiently done together. And does not require any PSF estimation. Finally extend this approach to color images with a strategy for removing chrominance artifacts. [6]

Yunhan Dong, Anthony K Milne, and Bruce C Forster “A Sar Speckle Filtering Algorithm Towards Edge Sharpening” sharpen the image is filtered using various filters including the Lee filter, Kuan filter, Frost filter, mean filter and the proposed filter. To evaluate the performance of a filter, one can analyze data in the frequency domain. In order to view frequency Component changes. In DFFT is used for data analysis in this paper. Components between the original data and the filtered data for the uniform area. In this paper behaviors of the four filters, i.e., the mean filter, Lee filter, Frost filter and the proposed filter, are very similar for uniform areas, as expected. The difference in frequency components to be positive indicates the frequency components have been reduced, thus the data in spatial domain have been smoothed. [7]

A speckle filtering algorithm for edge sharpening and enhancement has been proposed. Its performance in terms of edge enhancement as well as mean preservation and standard deviation reduction has been analyzed. The preservation of the intrinsic texture of the filter is also tested, and found to be comparable to other adaptive filters. The algorithm can be applied in conjunction with other speckle filters in order to sharpen edges which might be smeared. [8]

“A Comprehensive Review of Image Enhancement Techniques” by H. K. Sawant, Mahendra Deore, **they** form a novel image enhancement technique “image pixel interdependency linear perceptron network (IPILP) for image enhancement that provides a better result for contrast enhancement with brightness preservation. IPILP uses the curvelet and perceptron network for image enhancement. In this paper The curvelet transform is used to transform an image into multi-resolution mode and perceptron network is used to adjust the weight of input image or values. In this method for contrast enhancement has applied on several images, by using two parameters namely AMBE and PSNR, mathematically proved that, the method is better than other contrast enhancement methods. [9]

From the continuous survey, it is observed that the advantage of motion blur by Hui Ji and Chaoqiang Liu approach over available techniques. By working on the image gradients, they obtain a periodic pattern which exists in a wide range of motion types and robust to noise. Also, the proposed Fourier- Radon transform provides a robust algorithm to catch this periodic pattern even in noisy images.[10,11] The blurred image due to camera shakes often cannot be modeled well by a uniform velocity motion blurring. Instead, a trapezoid motion or a ramp motion is a Better description of camera shakes.[12,13] Also, the motion blurring of the object is often accompanied by the out-of-focus blurring of the background. This algorithm still can find the motion-blurring kernel in many cases while the other techniques cannot. [14]

From the careful study of reported work, it is observed that researchers had proposed various techniques to enhancement of image and improving the quality of image. But up to the result of this survey regarding improving the quality of image, no one had suggested use of GLAS algorithm, which work on the weekly blur and strongly noisy image.

It also know that, image processing field is faster growing field today. And according to image enhancement this methodology will able to increase the quality of image, by using GLAS algorithm, we will improve the quality of weekly blur and strongly noisy image. Considering all this constraint regarding the demand of todays for improving the quality of image, the expected research will be taken to image enhancement methodology to improve the quality of image by using GLAS algorithm.

3. CONCLUSION

Image processing field is faster growing field today. And according to image enhancement this methodology will able to increase the quality of image, by using GLAS algorithm, we will improve the quality of weekly blur and strongly noisy image. Considering all this constraint regarding the demand of todays for improving the quality of image, the expected research will be taken to image enhancement methodology to improve the quality of image by using GLAS algorithm.

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