DIGITAL IMAGE ENHANCEMENT USING MULTIPLE MOTION ANALYSIS

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ABSTRACT

Objective of Image enhancement is to process an image so that result is more suitable than original image for specific application. Digital image enhancement techniques provide a multitude of choices for improving the visual quality of images. Appropriate choice of such techniques is greatly influenced by the imaging modality, task at hand and viewing conditions. This project will provide an overview of underlying concepts, along with algorithms commonly used for image enhancement. The paper focuses on spatial domain techniques for image enhancement, with particular reference to point processing methods and histogram processing.

INTRODUCTION

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associated with that image. Usually Image Processing system includes treating images as two dimensional signals while applying already set signal processing methods to them. It is among

rapidly growing technologies today, with its applications in various aspects of a business.

Image Processing forms core research area within engineering and computer science disciplines too.

SYSTEM MODEL

Image restoration removes or minimizes some known degradations in an image. In many image processing applications, geometrical transformations facilitate processing. Examples are image restoration, where one frequently wants to model the degradation process as space invariant, or the calibration of a measurement device, or a correction correction in order to remove a relative movement between object. Multiresolution/multi orientation methods, such as the wavelet transform, originally developed in the signal processing field have been proposed for image enhancement, segmentation or edge detection in the field of digital mammography since it

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ADVANTAGE:

- ✓ The proposed method reduces almost noise in images.
- ✓ It also reduces time complexity of image enhancement process.
- ✓ Enhancements are used to make it easier for visual interpretation and understanding of imagery.

TYPES OF DIGITAL IMAGE

In the field of image processing, it is useful to include both types of image analog and digital. The mathematical model of computing the value of image depends on the calculation of two variables (X direction and Y direction). The digital image is represented in a two-dimensional array of discrete values of the image. Several techniques are used to enhance and process an image. Therefore, it is recommended to define the type of image first and then choose the suitable method to enhance it. An image is defined as 2D function f(x, y). Where x and y is spatial coordinate and f is amplitude of any pair (x, y) is called intensity level of the image at any point. Image has a finite number of elements, which has a specific value and location. Each element called a pixel. The digital image is a numeric representation of predefined pixels.

- ✓ **1-Binary image:** means the pixel value is either white or black. There are only two possible values for each pixel either 0(black) or 1(White), one bit per pixel is needed.
- ✓ **2- Grayscale image:** In this type of images, each pixel is grey shade, which has value normally 0 to 255, which means each pixel in the image can be shown by eight bits (one byte). However, ranges of grayscale can be used.
- ✓ **3- True Color or RGB:** RGB image has three values; red, green and blue. Each pixel in the RGB image carries one of these colours. The range of RGB image is from 0 – 255, and that means 2563 different possibilities of colours values. Each pixel in the image represents three values which are red, green and blue [3]. However, there is a particular type of colour image called Indexed or palette. The difference is that the indexed image has a fewer number of diverse colours

BLOCK DIAGRAM

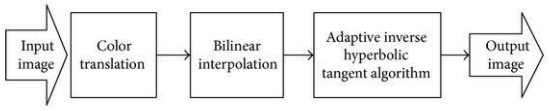

IMAGE PROCESSING

Image processing is a method to convert an image into digital form and perform some operations on it, in order to get an enhanced image or to extract some useful information from it. It is a type of signal dispensation in which input is image, like video frame or photograph and output may be image or characteristics associated with that image. Usually Image Processing system includes treating images as two dimensional signals while applying already set signal processing methods to them. It is among rapidly growing technologies today, with its applications in various aspects of a business. Image Processing forms core research area within engineering and computer science disciplines too.

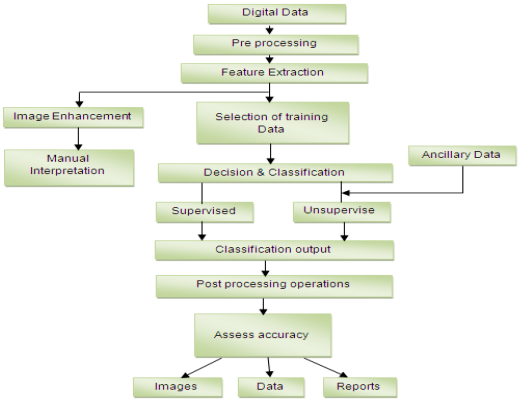

Image Processing

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IMAGE INTERPOLATION

Image interpolation can be described as the process of using known data to estimate values at unknown locations.The simplest of the B-spline interpolators are of the zero and fifirst orders. These are known as pixel replication and bilinear interpolation , respectively. In pixel replication, each output pixel simply obtains the value of the closest input pixel. In bilinear interpolation, the basis function is piecewise linear which means that each output pixel may be computed as a linear combination of up to four input pixels. Both pixel replication and bilinear interpolation are very common, and they are known to perform satisfactorily for interpolating smooth textures.

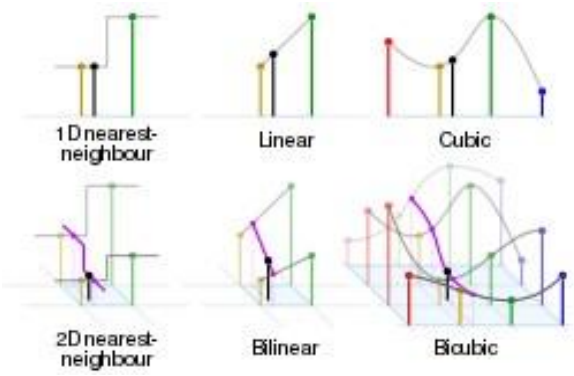
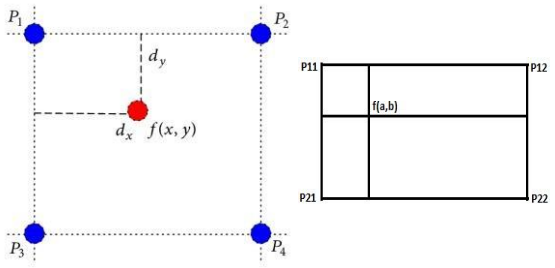


Fig .Types of Interpolation

BILINEAR INTERPOLATION



RESIZING IMAGE

Image interpolation occurs when you resize or distort your image from one pixel grid to another. Image resizing is necessary when you need to increase or decrease the total number of pixels, whereas remapping can occur when you are correcting for lens distortion or rotating an image. Zooming refers to increase the quantity of pixels, so that when you zoom an image, you will see more detail.

ALGORITHM

Images are enlarged to enhance image resolution, increase image quality, and improve identification. The goal of this approach is to maintain image quality while eliminating image distortion, such as blurring and rough edges, upon image enlargement. Traditional interpolation methods are commonly employed in image enlargement due to their simplicity and efficiency. Interpolation generally comprises two methods: nearest-neighbor interpolation and bilinear interpolation. When the continuous function passes through, the interpolation function can be used to calculate the sampling points. In theory, higher order interpolation functions are similar to continuous functions.

EXPERIMENTAL RESULTS

In this we test our strategy for improving the overall clarity of the image. As the reason mentioned in this, we compared the resultant image with the image that has been given as the inputshows the interpolated result and their local sharpness map. As a discussion of the selection of quality measure, we compared the measures of: contrast map, STD map, average gradient map and sharpness mapshows the experimental results on gray and color images using bilinearr interpolation with sharpness evaluation. As the interpolated image has a better clarity and better visualization for understanding tha data that has contained on the image.

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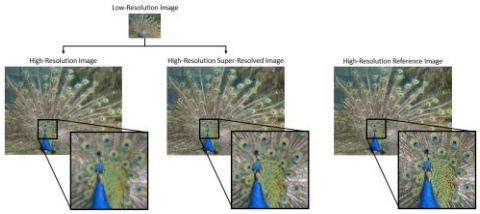

CONCLUSION

A block ROI technique is implemented and test for large and scalable image reconstruction has been presented using the bilinear, bicubic algorithm. The proposed block ROI method gives an effective criterion for image partitioning toensure the validity of image reconstruction and to improve efficiency. Based on this method, a large and scalable SAR image isreconstructed efficiently. Experimental results have shown that the proposed block ROI technique can fulfill the necessities of validity and flexibility in large and scalable image reconstruction.

Temporal integration of registered images proves to be a powerful approach to motion analysis enabling humanlike tracking of moving objects Once good motion estimation and segmentation of a tracked object are obtained it becomes possible to enhance the object images Fusing information on tracked objects from several registered frames enables reconstruction of occluded regions improvement of image resolution and reconstruction of transparent moving object.

REFERENCE

[1]. Yunfeng Zhang, Qinglan Fan, Fangxun Bao, Yifang Liu, and Caiming Zhang, “Single-Image Super-Resolution Based on Rational Fractal Interpolation” IEEE ,image process., vol 27,issue 8, page.3782-3797, Aug 2018.

[2]. A.Ramesh, A.V.karpagam, M.Manikandan, “Enhancemant of interpolation mechanism in large and scalable images” IEEE, signal process., INSPEC No:17315398, March 2017.

[3]. Atul Bansal, Rochak Bajpai, J.P. saini, “simulation of image enhancement techniques” IEEE , image processs., INSPEC No 9465136,April 2007.

[4]. Y. Xu, Y. Quan, and H. Ling, *A new texture descriptor using multifractal analysis in multi-orientation wavelet pyramid," in Proc. IEEE Conf. Comput. Vis. Pattern Recognit. (CVPR), Jun. 2010, pp. 161-168.

[5]. R. Zeyde, M. Elad, and M. Protter, "On single image scale-up using sparserepresentations," In Curves and Surfaces, pp. 711-730, Jun. 2010.

[6]. E. Agustsson and R. Timofte, "NTIRE 2017 Challenge on Single Image Super-Resolution: Dataset and Study," Computer Vision and Pattern Recognition Workshops (CVPRW), pp. 1122-1131, Jul. 2017.

[7]. Y. W. Tai, S. Liu, M. S. Brown, and S. Lin, "Super resolution using edge prior and single image detail synthesis," in Proc. IEEE Conf. Comp. Vis. Pattern Recogn. (CVPR), pp. 2400-2407, Jun. 2010

[8]. R.W.Jr. Weeks,(1996). Fundamental of Electronic Image Processing . Bellingham: SPIE Press .

[9]. A. K. Jain, Fundamentals of Digital Image Processing. Englewood Cliffs, NJ: Prentice Hall, 1989.

[10]. W. K. Pratt, Digital image processing, Prentice Hall, 1989.

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