ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

*International Journal of Advanced Research in Computer and Communication Engineering*
*Vol. 4, Issue 3, March 2015*

# Resolution Enrichment Techniques for Image incorporated with Text

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**Abstract:** Resolution is designated as significant holding for images. Resolution is an underlined expression of any image. Gratifying quality images are required almost in every field. For this we propose new modified algorithm having the extention in scaling and the algorithm is applied on image mingled with text for producing the pleasing quality of image.

**Keywords**: Interpolating filters, Artifacts, Magnified, Image Resolution Enrichment

## I. INTRODUCTION

High resolution images are required almost in every field. For example in field of biomedical scrutiny, for images of remote field, in field of spacious images, in field of geoscientific studies and in the field of armed forces. Resolution is designated as significant holding for images. Images are being refined in such a way to get super enhanced image. Resolution enrichment of image is a technique that assists to achieve high-resolution images from low-resolution images. It is vital to acquire pleasing quality of image. Image resolution is always a crucial attribute for all sorts of images. The parameters for image resolution enrichment are frequency and space. In imaging devices, the object optical system is used in which the image is drawn at surface on some point at the surface. Radiation on the image is total amount of reflection along with transmission on the surface. The process of improving the resolution of the image can be seen as increasing the density. We are going to apply a new algorithm for improving the resolution of image with imaging. After zooming of image the quality of image get increased to a great extend. Resolution enrichment is always being lump with the interpolation. Interpolation has been extensively used in numerous image processing applications. The interpolation-based image resolution enhancement is very common. There are many interpolation techniques matured for multiplying the virtue of images. Most common feature of interpolation is efficiency. The algorithms based on interpolation are simple and easy to implement. These algorithms used for image enrichment are as follows:

1. Interpolation nearest neighbour interpolation,
2. Bilinear interpolation
3. Interpolation cubic spine

Various resolution enrichment techniques for image are present. These are CWT based enrichment technique, DWT based enrichment technique and SWT based enrichment technique. In CWT based enrichment – CWT is used to disintegrate an input image into distinctive sub bands. Firstly the low resolution image is disintegrated followed by high resolution image. Then, the high-frequency sub band images and the input image are interpolated, and by all combinations the high resolution image is obtained. In DWT based enrichment- DWT distribute the image into distinctive sub band images, namely, LL, LH, HL, and HH. Interpolation is applied on the high frequency bands as they contain the high frequency segments to get the high resolution image. In SWT based enrichment technique- the image is magnified by altering the illumination of the image.

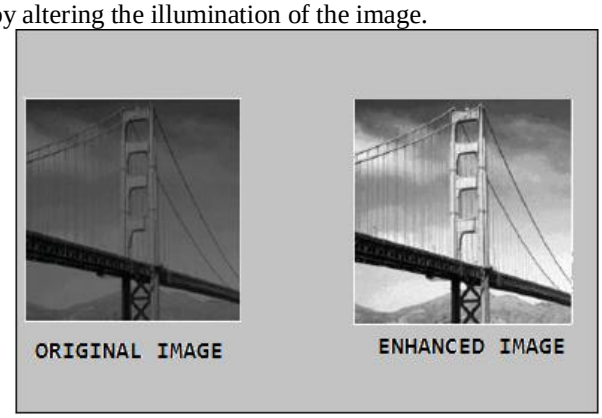


Figure 1 Image Enrichment

## II. LITERATURE REVIEW

O.Harikrishna, A.Maheshwari states that Satellite images are used in many applications such as geosciences studies, astronomy, and geographical information systems. One of the most important quality factors in images comes from its resolution. Interpolation in image processing is a well-known method to increase the resolution of a digital image. Interpolation has been widely used in many image-processing applications such as facial reconstruction, multiple-description coding, and resolution enhancement. they proposed a new satellite image resolution enhancement technique based on the interpolation of the high-frequency sub bands obtained by discrete wavelet transform (DWT) and the input image. The proposed resolution enhancement technique uses DWT to decompose the input image into different sub bands. Then, the high-frequency sub band images and the input low-resolution image have been interpolated, followed by

ISSN (Online) 2278-1021
ISSN (Print) 2319-5940

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combining all these images to generate a new resolution-enhanced image by using inverse DWT. In order to achieve a sharper image, an intermediate stage for estimating the high-frequency sub bands has been proposed. The proposed technique has been tested on satellite benchmark images. The quantitative and visual results show the superiority of the proposed technique over the conventional and state-of-art image resolution enhancement techniques [7]

Ms.M.Merlin Bhakiya, Ms.N.T.Sasikala proposed that satellite image resolution enhancement technique based on the interpolation of the high-frequency sub bands obtained by dual tree complex wavelet (DTCWT) transform and the input image. The proposed resolution enhancement technique uses DTCWT to decompose the input image into different sub-bands. Then, the high-frequency sub-band images and the input low-resolution image have been interpolated, followed by combining all these images to generate a new resolution-enhanced image by using inverse DTCWT. In order to achieve a sharper image, an intermediate stage for estimating the high-frequency sub bands has been proposed. The proposed technique has been tested on satellite benchmark images. The quantitative peak signal-to-noise ratio and root mean square error and visual results show the superiority of the proposed technique over the conventional and state-of-art image resolution enhancement techniques. Adaptive Histogram Equalization is the algorithm which have improved the image resolution. The PSNR improvement of the proposed technique is up to 19.79 dB [9]

S. E. El-Khamy, M. M. Hadhoud, M. I. Dessouky, B. M. Salam, and F. E. A. El-Samie presents some new techniques for high resolution (HR) image processing and compares between them. The paper focuses on two main topics, image interpolation and image super resolution. By image interpolation, we mean extracting an HR image from a single degraded low resolution (LR) image. Polynomial based image interpolation is reviewed. Some new techniques for adaptive image interpolation and inverse image interpolation are presented. The other topic treated in this paper is image super-resolution. By image super resolution, they mean extracting a single HR image either from multiple observations or multiple frames. The paper focuses on the problem of image super resolution using wavelet fusion and presents several super resolution reconstruction algorithms based on the idea of wavelet fusion. [1]

Pingxiang Li, Huanfeng Shen, and Liangpei Zhang proposed that in the field of digital photogrammetry, it is very important to enhance the image resolution. By enhancement, a clearer image with higher resolution is produced. So far, the enhancement technique is widely applied in various photogrammetric images. However, because of the restriction of the CCD sensor itself, the number of pixels on the sensor isn't much enough in some case. The image quality is affected and restricted. To solve this problem, the enhancement techniques are expended mainly in two categories: One is hardware solution; the other is software solution. In this paper, we propose a software algorithm for the enhancement of the image resolution considering inaccurate sub-pixel matching. In the proposed algorithm, the shifts, the gray values of the low-resolution images and the enhancement ratio are used to calculate the gray values of the higher- resolution image iteratively. Thus, the new image has higher resolution, so that it has higher definition. Experimental results indicate that the proposed algorithm has more universal applications. [4]

B Siva Kumar, S Nagaraj presents An image resolution enhancement technique based on interpolation of the high frequency sub band images obtained by discrete wavelet transform (DWT) and the input image. The edges are enhanced by introducing an intermediate stage by using stationary wavelet transform (SWT). DWT is applied in order to decompose an input image into different subbands. Then the high frequency subbands as well as the input image are interpolated. The estimated high frequency subbands are being modified by using high frequency sub band obtained through SWT. Then all these subbands are combined to generate a new high resolution image by using inverse DWT (IDWT). The quantitative and visual results are showing the superiority of the proposed technique over the conventional and state-of-art image resolution enhancement techniques. [14]

## III. PROBLEM STATEMENT

The work is about to Analyse the structure of image with its resolution from previous history. The main problem in this area is image enrichment. Mathematical problem in biomedical imaging. In medical imaging four key problems:

1. Segmentation
2. Registration
3. Visualization
4. Simulation

Image Mosaicking -Transformation between image and image then transforms one of them and blend them together. This problem can be divided into three sub-problems:

1) Determine undifferentiated points between the two images.
2) Measure transmutation between the two images.
3) Alter and interfuse the images.

The complication is to assign the labels to each and every pixel. For solving labelling problem we can use graph cut algorithm. On the other hand, multi-label issue cannot be globally underestimated.

## IV. OBJECTIVES

We give overview of different image resolution enrichment methods which had been studied so far and modify a popular method for efficiently improving the image enhancement. Our objective is to compare the implemented algorithm on the basis of various parameters like usability, application area, time required for study. The foremost objectives of our image enrichment techniques are:

1) To understand the working of the Image resolution.

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2) To determine the different methods of image resolution Enhancement.
3) To evaluate the different kind of parameters on which the algorithm work.
4) To develop efficient image resolution algorithm for analyze the images resolution.
5) To reduce the SNR of images after resolution Enhancement.
6) To implement the designed algorithm in any tool.
7) To generate and compare the results of modified algorithm.

## V. PROPOSED METHODOLOGY

We use MATLAB for the implementation of our algorithm. The image resolution enhancement process is been implemented by using the following steps:

a. The first step is image capturing fewer than 40 x magnifications.
b. Then the image will be saved by using a particular format.
c. The third step will be to select picture with 3 different types which is normal image, bright image and dark image. Three images are selected for each different type

After this we apply following steps:

1) The image is divided into local image regions and then these regions are analyzed in terms of edges and texture.
2) The algorithm is compared with standard bucolic interpolation method and it had been made sure that it does not suffer from ringing and bumming artifacts which are very common in image enhancement algorithms.
3) The previous implemented algorithm had also been extended for scaling of bi-level images which is another variant of the same method.
4) We are going to extend the algorithm and it will be based on selecting different interpolating filters dynamically for nonlinear adaptive methods.
5) We have implemented the modified algorithm for images in which text and images are combined together. As the behaviour of the algorithm will be different for text and images so we will study the results produced by the modified algorithm which can handle images having blended text and pictures.
6) We have studied the modified algorithm is free from the artifacts such as ringing and bumming due to modifications; these artifacts had again come up in the results.
7) The results found by the above mentioned algorithm have been compared to previous methods as after implemented by different authors.

## VI. CONCLUSION AND FUTURE WORK

We have understood the existing methods of resolution enhancement. The proposed algorithm made by considering different parameters is compared with the conventional algorithm. And we have extended the conventional algorithm in terms of scaling. We have applied the new modified algorithm of resolution enrichment on images merged with text. The modified algorithm is relieved from artifacts. We now get very good quality of images. Diffusion Tensor Imaging (DTI) is an imaging modality that is gaining widespread attention due to its potential of imaging fiber tracts in the brain. However, the current acquisition resolution falls short of its intended use, viz. imaging the micro-structural information in the brain. One of the consequences of low resolution are artifacts such as PVE (partial volume effect), where a single imaged voxel may potentially contain multiple anatomical substructures or tissues. PVE can severely limit the analysis of directional and structural connectivity. In the future, we intend to investigate the effect of the proposed method to mitigate such issues.

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