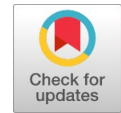# Enhancement of Satellite Imagesusing Image Sharpening Technique

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Abstract: In many image processing applications, a wide range of image enhancement techniques are being proposed. Many of these techniques demanda lot of critical and advance steps, but the resultingimage perception is not satisfactory. This paper proposes a novel sharpening method which is being experimented with additional steps. In the first step, the color image is transformed into grayscale image, then edge detection process is applied using Laplacian technique. Then deduct this image from the original image. The resulting image is as expected; After performing the enhancement process,the high quality of the image can be indicated using the Tenengrad criterion. The resulting image manifested the difference in certain areas, the dimension and the depth as well. Histogram equalization technique can also be applied to change the images color.

Keywords : Image sharpening, Laplacian technique, Histogram equalization technique,high quality image..

I. INTRODUCTION

Image sharpening is a technique which increases both the image detail and the edges of the images .The step helps to increase the resolution and the sharpness of the image. In the previous steps, image enhancement is performedbefore applying the data. Because of this, the image and its edge looksimilar.In the case of video color image, the color intensity of the video image depends on the pixel performance. Every pixel component consists of RGB. Based on the RGB color model, some weights are introduced for the three basic colors; red, green and blue, This weightage gets varied according to the percentage of the intensity and luminance.[1]

II. SYSTEM ANALYSIS

A. Existing system:

 In existing, to enhance the colored satellite image some techniques has been used. This could provide the clarity with less efficiency.[2]

B. Proposed system:

  Here we propose some new combination of techniques to enhance the colored satellite images. Histogram equalization is used in this project to provide the colored satellite image efficiently with complete clarity.[3]
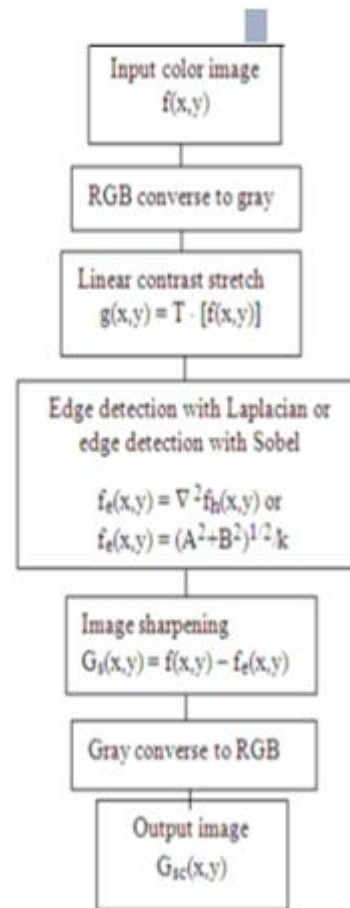

Fig 1. Image Enhancement technique

III. MODULES DESCRIPTION

C.Histogram equalisation

By this process, lower local contrast areas can achieve a higher contrast. This is achieved by effectively distributing the frequently applied intensity values.This method can be applied for images that are either bright or dark. The method can provide better clarity in photographs that are over or under-exposed.[4] Thisis a straightforward technique and uses an invertible operator[9]. Therefore, if the histogram equalization function is understood, then the original histogram can be recovered. No intensive calculation is required. It has a drawback that it is indiscriminate. Sometimes, while decreasing the usable signal, the contrast of background noise may get increased.[5]

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D.Color depth

Color depthalso called as bit depthdefines the minimum number of bitsrequired to denote the color of a single pixel.This idea is called as bits per pixel (bpp), particularly when mentionedalong with the number of bits used. If the color depth is high, then wider range of differentpossible colors can be obtained.[6]

E. Pixel depth

It represents the number of data bits each pixel contains. In the case of 8-bit contexts, the pixel depth is taken as 8, and each display pixelwill be any one of 256 possible colors or shades of gray. Pixel Depth can be defined as the number of different possible colors on the screen.[7]

Fig 2.Original Image

IV. TESTING

F.System testing

System Testing is the initial stage of implementation, which is performed to ensure that the system operatescorrectly and effectively before live operation commences.Implementation should provide a confirmation and it providesan opportunity to prove the users that the system works. The objective of testing is also to discover errors.[10]

Testing of the proposed system was done at all stages of project development. After the completion of each module,it is tested by giving sample data inputs. Thus each module is ensured error free.[11-15] Proper error handling methods were adopted to make the system performance more efficient. So testing was a very easy process. Expected output of the system that is desired to get was compared with the obtained actual output and found to be matching. Inputs were given

and the outputs were analyzed and found to be error free and satisfied.[8]

G. Unit testing

Unit Testing is a software verification method where a programmer tests whether the individual portions of the source code are fit for use. Its implementation can be very manual or formalized. The main aim of unit testing is to separate each individual part of the program and to show that it is correct.This can be carried out during programming to check whether the module is functioning satisfactorily.[16-20]

V.RESULTS AND DISCUSSION
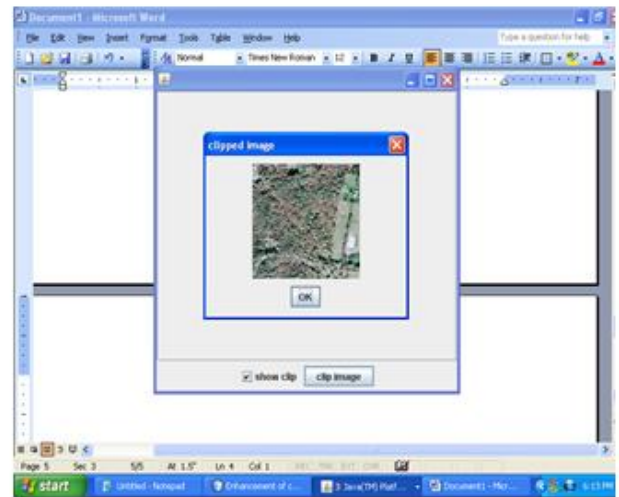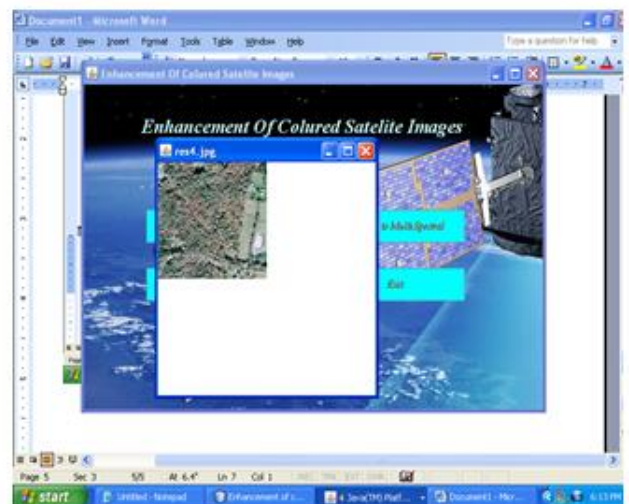

Fig 4. Clipped image

Fig 5. Enhanced image

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Fig 6. First step –sharpen
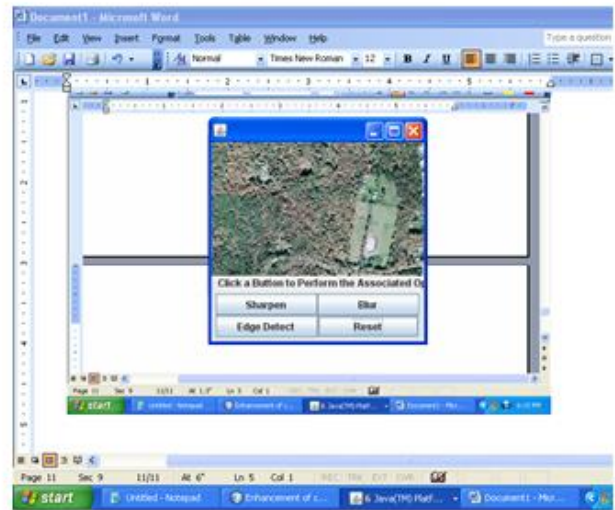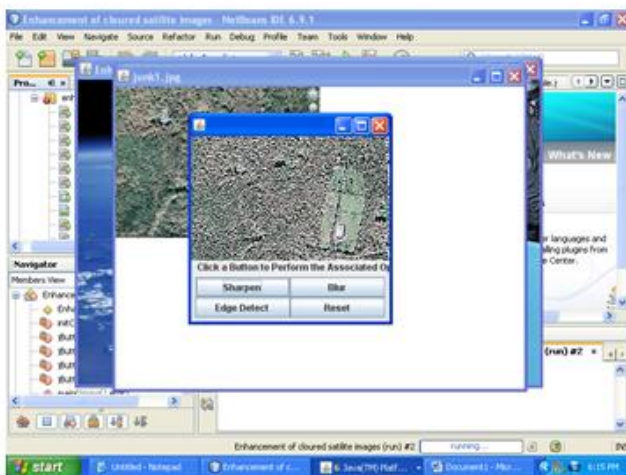
Fig 7 . Second step –Blur

Fig 8 . Third step –Edge detect

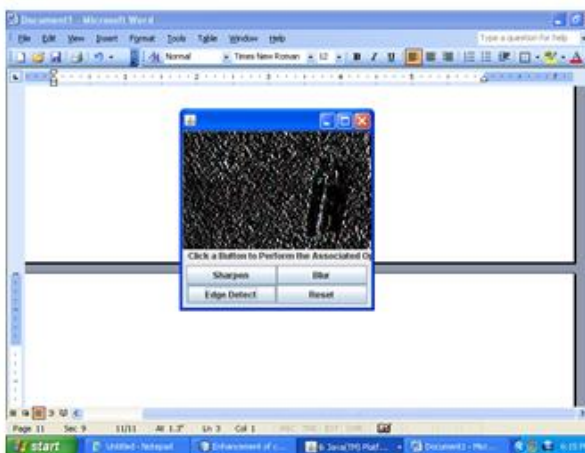**Fig 9 . Fourth step -Reset**

VI. CONCLUSION

Thus the filtering sharpening using Laplacian techniqueprovides an enhanced color reproduction than the original image. Alsothedata at sea and land levels are more accurately depicted. Here Histogram equalization is done to show the variations in the images. This technique can be appliedforenhancing the detail and edge clarity of satellite images.

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