Volume 3, Issue 8, August 2013 ISSN: 2277 128X

International Journal of Advanced Research in Computer Science and Software Engineering

Research Paper

Available online at: www.ijarcsse.com

Dehazing Based on Normalized Edge Enhance and Removal of Global Brightness

[1]Ashok Shrivastava,
M.tech CSE Jhansi
UP, India

[2]Er. Rekha Kumari
Assist. Prof. CSE Jhansi
UP,India

Abstract- The aim of this research is to solve any type of foggy problem by using our EERGB algorithm that hold two concepts namely edges preserving and objects preserving. In our work first we apply enhancement method than after calculate luminance image, chromatic Blue image and chromatic Red image of the query image. The luminance image removing the fog and show the clear image objects of the image. Also it is showing total number of edges. Other two images are preserving the color with respect to particular color value. After this we merge the all resulted image and finally getting the fog free image.

Keywords-RGB image, image processing, color model, binary image, 4-connected component.

I. INTRODUCTION

Image of outdoor scenes are usually degraded by the any fog related medium in the atmosphere [6]. Haze, fog, and smoke are such phenomena due to atmospheric absorption and scattering. The irradiance received by the camera from the scene point is attenuated along the line of sight. Furthermore, the incoming light is blended with the air light [9]—ambient light reflected into the line of sight by atmospheric particles. The degraded images lose contrast and color fidelity [3, 4], as shown in Fig. 1a. Since the amount of scattering depends on the distance of the scene points from the camera, the degradation is spatially variant. Dehazing is highly desired in computational photography and computer vision applications. First, removing haze can significantly increase the visibility of the scene and correct the color shift caused by the air light. In general, the haze-free image is more visually pleasing. Second, most computer vision algorithms, from low-level image analysis to high-level object recognition, usually assume that the input image is the scene radiance. The performance of many vision algorithms like feature detection, filtering, and photometric analysis will inevitably suffer from the biased and low-contrast scene radiance. Last, haze removal can provide depth information and benefit many vision algorithms and advanced image editing. However, haze removal is a challenging problem because the haze is dependent on the unknown depth. The problem is under constrained if the input is only a single hazy image. Therefore, many methods have been proposed by using multiple images or additional information. Polarization based methods [2, 10] remove the haze effect through two or more images taken with different degrees of polarization. In [7, 8, 11] more constraints are obtained from multiple images of the same scene under different weather conditions. In this paper, we propose a new approach based on normalized edge enhance and remove of global brightness method. In hazy images, the intensity of these dark pixels in that channel is mainly contributed by the light [5]. Therefore, these dark pixels can directly provide an accurate estimation of the haze transmission.

II. What is fog

Fog is essentially a dense cloud of water droplets, or cloud, that is close to the ground. It is a collection of liquid water droplets or ice crystals suspended in the air at or near the Earth's surface [1]. Fog reduces visibility to less than 1 km.

III. Previous Work

The proposed hue preserving color image contrast Fog removing algorithm by taking care of the simple architectural principles of processors, the proposed algorithm [1] has been made computationally very efficient and fast. The algorithm and fog image database are given below:

Figure 1

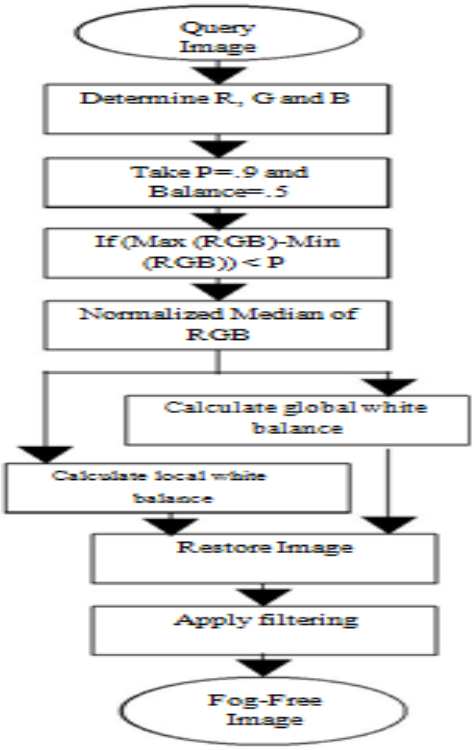


Figure 2

IV. Proposed Work

The fog image database is shown in Figure 1. In our proposed work, we apply some steps and get fog free image. The steps are following.

Algorithm for my work-

Input: - Get any type of fogy images.

Output: - Find out fog free image with respect to edges.

Step-1

first we calculate gray image (lumance image), chromatic blue and chromatic red image by using equation 1.

$$Y = 0.299R + 0.587G + 0.114B$$
$$Cb = 128 - 0.168736R - 0.331264G + 0.5B$$
$$Cr = 128 + 0.5R - 0.418688G - 0.081312$$

----------(1)

Step-2

- Enhancement the luminance image.
- Apply filtering.
- Calculate Overall brightness.
- Calculate Binary Image.

Step-3

- Calculate Normalized Binary Image.
- Apply edges enhancement method.
- Calculate edges.

Step-4

- Merge step 2 and step 3 image (above Binary image and enhance image). Again apply color enhancement method.

Step-5

- Apply possible color restoration on step 4 image.

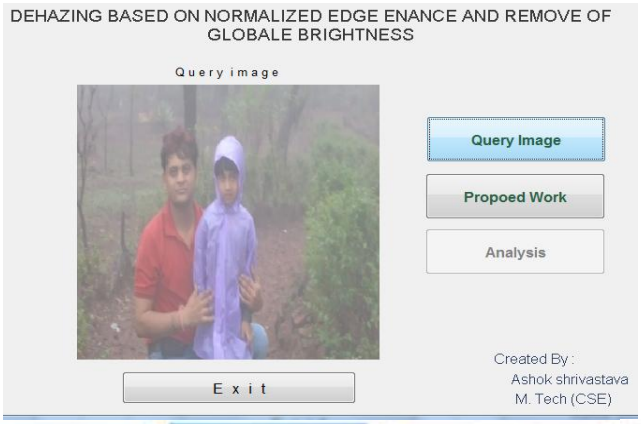
Step-6

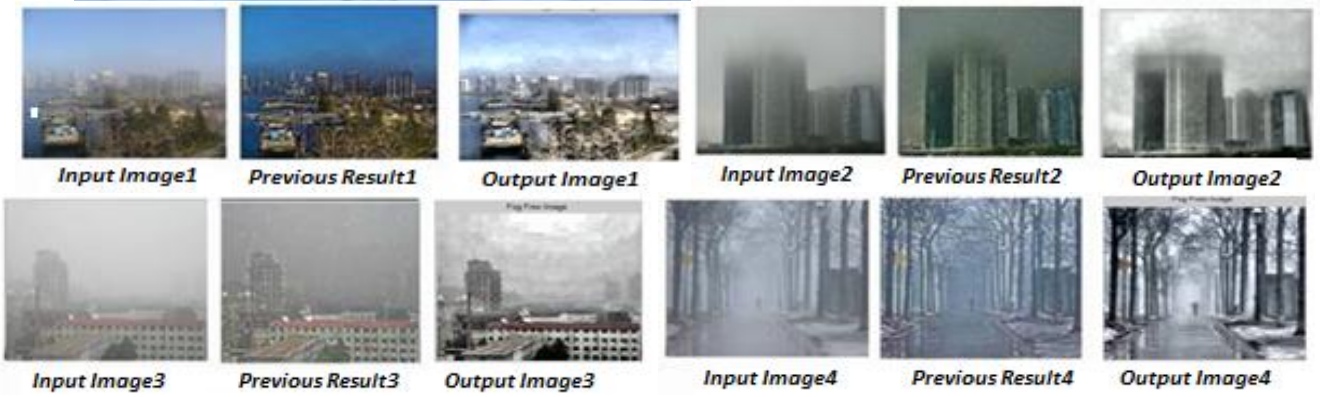
- Compare with Input Image regarding edges value.

Step-7

- We get clear fog free image compare to previous work.

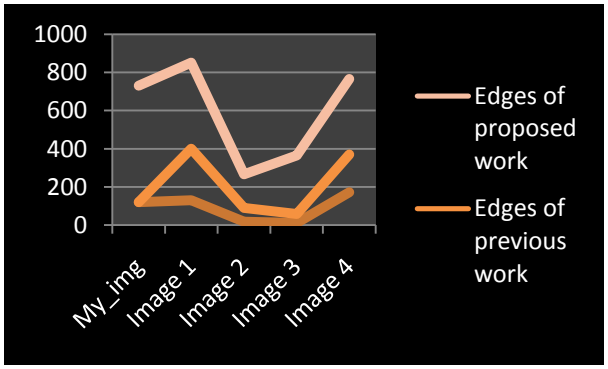
V. Result and Analysis





Query Image	*Edges of Query Image*	*Edges of previous work*	*Edges of proposed work*
My_img	*121*	*---*	*609*
Image 1	*130*	*271*	*450*
Image 2	*19*	*71*	*177*
Image 3	*12*	*46*	*308*
Image 4	*172*	*199*	*395*
Image 5	*353*	*---*	*480*

Comparative study of previous and proposed work.



VI. Conclusion and future work

According to my EERGB algorithm, we can say that it is much better than previous work regarding to edge preserving method, which in this paper used. Therefore, the proposed algorithm for the problem is an efficient and reliable choice for any fog removing from the color image and also useful in hue preserving contrast enhancement of colored images. Finally, our method achieves a linear complexity and results demonstrate the effectiveness of our method. In future we can also solve the original color preserving problem by using some techniques like color descriptor, color histogram, FFT, DCT and GENETIIC ALGORITHM for getting the better fog free image.

Reference.

[1] *Jyoti Sahu "Design a new Methedology for Removing Fog from Image",IJACR Journal, Volume-2 Number-4,Issue-7,Dec-2012.*

[2] *R. N. Strickland, C. S. Kim, and W. F. McDonnel, "Digital color image enhancement based on the saturation component," Opt. Eng., vol. 26, no. 7, pp. 609–616, 1987.*

[3] *R. Fattal. Single image dehazing. In SIGGRAPH, pages 1–9, 2008.*

[4] *E. Hsu, T. Mertens, S. Paris, S. Avidan, and F. Durand. Light mixture estimation for spatially varying white balance. In SIGGRAPH, pages 1–7, 2008.*

[5] *A. Levin, D. Lischinski, and Y. Weiss. A closed form solution to natural image matting. CVPR, 1:61–68, 2006.*

[6] *S. G. Narasimhan and S. K. Nayar. Contrast restoration of weather degraded images. PAMI , 25:713–724,2003.*

[7] *P. E. Trahanias and A. N. Venetsanopoulos, "Color image enhancement through 3-D histogram equalization," in Proc. 15th IAPR Int. Conf. Pattern Recognition, vol. 1, 1992, pp. 545–548.*

[8] *V. Buzuloiu, M. Ciuc, R. M. Rangayyan, and C. Vertan, "Adaptive- neighborhood histogram equalization of color images," J. Electron. Imag., vol. 10,no.2,pp.445–459,2001.*

[9] *R. S. Berns, F. W. Billmeyer, and M. Saltzman, Billmeyer and Saltzman's Principles of Color Technology, 3rd ed. New York:Wiley, 2000.*

[10] *B. A. Thomas, R. N. Strickland, and J. J. Rodriguez, "Color image enhancement using spatially adaptive saturation feedback," in Proc. IEEE Int. Conf. onImageProcessing,1997.*

[11] *A. Toet, "Multiscale color image enhancement," Pattern Recognit. Lett., vol. 13, pp. 167–174, 1992.*

