Correcting color changes in underwater images using WCID algorithm

K.PRABHAKARAN
M.E Communication Systems
K.Ramakrishnan College Of Engineering, Samayapuram
Trichy, India
E-Mail-Prabhakaran299@Gmail.Com

Abstract— In this paper, I propose a wavelength compensation and image dehazing.WCID algorithm to detect distortion for color change and light scattering from underwater images. Scattered light is created by light incident of an object reflected and deflected in more times by particles present in water before reaching the camera. This the reason for turn lower contrast of image and color deviation of the image captured by camera. Color change created by light travelling in the water for different wavelength. This paper to enhance the underwater images by WCID algorithm.WCID algorithm to find the PSNR and MSE parameter value. WCID output is more efficient compare to all other dehazing algorithm.

Keywords— ***color change, light scattering, WCID, underwater images, dehazing.***

I. INTRODUCTION

Light scattering is nothing but the light incident of the object that light reflected and deflected more times by particles present in the water. color change is light travelling in the water for different wavelength. Underwater photography is a more important for ocean engineering because it is used to scientific research such as census of population, assessing geological environments, monitoring the sea life. Underwater photography is more challenging because haze and light scattering distortion affect the underwater image. Haze created by light that is reflected and deflected and scattered by water particles. Color change mean light attenuated for different wavelength.

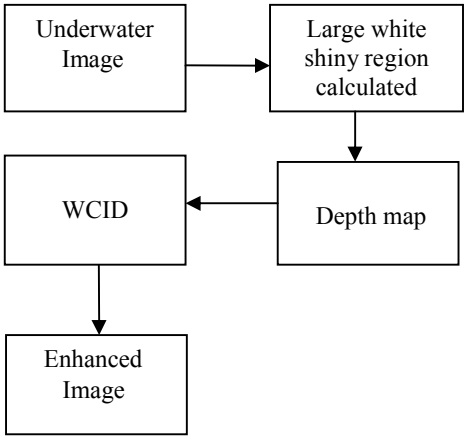
II. PROPOSED WORK

The algorithm for wavelength compensation and image dehazing (WCID) to enhance underwater images. WCID to remove distortions in light scattering and color changes. Dark-channel prior an existing scene-depth source method is used first to approximate the distances of the scene objects to the camera. The little intensities in the dark channel are mostly following three factors:1) shadows, e.g. the shadows of creatures, plankton, plants, or rocks in seabed images; 2) colorful objects or surfaces, e.g. green plants, red or yellow sands, and colorful rocks/minerals, deficient in certain color channels; and 3) dark objects or surfaces, e.g. dark creatures and stone. Based on the depth map for foreground and background image are segmented. The light intensities of foreground and background are then compared to determine whether an artificial light source is employed during the image acquiring process. If an artificial light source is detected, the luminance introduced by the auxiliary lighting is removed from the foreground area to avoid overcompensation in the stages followed. After, the dehazing algorithm and wavelength compensation are utilized to take out the haze effect and color varies along the underwater propagation path to the camera. The remaining energy ratio among changed color channels in the background light is use to calculate approximately the water depth inside an underwater scene. Energy compensation for each color channel is carrying out after to adjust the bluish tone to a natural color. With WCID, expensive optical instruments or stereo image pairs are no longer required. The WCID is enhancing visibility and the color balance of underwater images is restored, rendering high visual clearness and color fidelity.

A. Module

1) Large white shiny region
2) Depth map
3) Calculate PSNR and MSE
4) Dark channel image matting
5) WCID.

B. Block diagram



To take the input and to calculate the large white shiny region. Depth map is a Segmented for foreground and background of images. After to calculate the dark channel prior image matting and depth map. To calculate the RGB color analysis and contrast measurement technique. After to apply the wcid algorithm. WCID to calculate the dark channel prior and enhance the images. WCID mostly used for to calculate the PSNR and MSE parameter. WCID is a enhancement algorithm.WCID to compensate the light scattering and color change. It is wavelength compensation technique.

TABLE I. PERFORMANCE EVALUATION

s.no	Performance evaluation		
	Parameter	*WCID*	*Dark channel*
1	PSNR	49.978832	27.34
2	MSE	0.65324	1.032

III. OUTPUT

A. WCID

Image obtained after applying WCID

B. DARKCHANNEL

Image obtained after applying Dark Channel Estimation

IV. CONCLUSION

WCID algorithm proposed in this paper can effectively restore the color balance and remove haze. This method efficient compared to other dehazing method. Performance evaluation for PSNR and MSE in table 1.

In future work to enhance images for no-black-pixel constraint NBPC with combination of PA algorithm.

REFERENCES

[1] Carlevaris-Bianco.N, Mohan .A, and Eustice R.M, "Initial results in Underwater single image dehazing," in Proc. IEEE OCEANS, 2010, pp. 1–8

.

[2] Chao .L and Wang .M , "Removal of water scattering," in Proc. Int. Conf.Compute. Eng. Technol., 2010, vol. 2, pp. 35–39.

[3] Fattal .R, "Single image dehazing," in Proc. Int. Conf. Comput. Graph Interact. Tech., 2008, pp. 1–9.

[4] He .K, Sun .J, and Tang .X, "Single image haze removal using Dark

Chan nel prior," in Proc. IEEE CVPR, 2009, vol. 1, pp. 1956–1963.

[5] Hou .W, Gray D.J, Weidemann A.D, Fournier G.R, and Forand J.L, "Automated underwater image restoration and retrieval of related Optical Properties," in Proc.IGARSS, 2007, vol. 1, pp. 1889–1892.

[6] Iqbal .K, Abdul Salam .R, Osman .A, and Zawawi Talib "Underwater Image enhancement using an integrated color model," Int. J. Comput. Sci., vol.34, no.2,pp. 2– 12, 2007.

[7] Levin .A, Lischinski .D, and Weiss Y, "A closed form solution to natural Image matting," in Proc. IEEE CVPR, 2006, vol. 1, pp. 61– 68

K.PRABHAKARAN received the B.E degree in Electronics and Communication Engineering from Dhanalakshmi Srinivasan Engineering College, Perambalur in 2008.doing Master of Engineering in K.Ramakrishnan college of Engineering,Samayapuram,trichy.