ISSN2394-3777 (Print)
ISSN2394-3785 (Online)
Available online atwww.ijartet.com
International Journal of Advanced Research Trends in Engineering and Technology
(IJARTET) Vol. 5, Special Issue 14, April 2018

# AN EFFICIENT IMAGE ENHANCEMENT TECHNIQUE FOR BALANCING COLOR QUALITY IN UNDER WATER IMAGES

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## ABSTRACT

Creating an effective and objective in quality ranking metric for images which is taken underwater environments is a essential component that within underwater image processing, classification, especially for in underwater monitoring tasks. Subjective quality metrics are considered for giving the most reliable results, but which are classy, time-consuming and impractical for concurrent implementation and system integration process. Objective Image Quality Evaluation (IQE) methods can also be classified by taking a reference image, representing the remarkable signals, that exists. Then such a reference is available, here the evaluation is known as full-reference (FR) image quality assessment.

Here the another IQE approach is the reduced-reference (RR) quality assessment, which assumes that the incomplete information about the referenced signals are available and used for the quality evaluation. For underwater images where it cannot be obtained any other referenced image, no-reference, or a blind reference , objective image quality metric and it is needed to measure in the perceptual image quality. Such a measure would be capable for identifying the differences in deformed images; correlate with the human perception; reliably benchmark of image processing algorithms and also support in selecting the optimal operating parameters; it has low computational difficulty, and be implementable for real time processing.

**KEYWORDS**

Underwater image processing, under water white balancing,Dark Channel Prior (dcp), Objective Image Quality Evaluation, reduced-reference, deterioration of underwater, control of the underwater creation distant objects misty.

## INTRODUCTION AND OVERVIEW:

In this under water environment provides many rare attractions such as Pair of stingrays, shrimp, Galapagos penguin, marine animals and also fishes, wonderful landscapes, and mysterious shipwreck. And besides underwater photography, under water imaging having important sources of interest in the different branches of technologies and scientific researches, such as check up of underwater infrastructures, some scraps and cables, also detection of human made objects, control of the underwater creation distant objects misty. Practically.

The remaining of the paper is structured as follows. The next section briefly surveys the optical specifications of the under-water environment, before shortening the work related to underwater .we have presented the novel white-balancing approach, especially to designed underwater images. And then description including inputs and associated weight maps definition. Before concluding, we have present comparative quality and quantitative assessments of our white-balance underwater dehiscing techniques, as well as some results about their relevance to address common computer vision problems, namely image segmentation or reserving room and feature matching.

Fig: Method overview: two images are derived from a white-balanced version of the single input, and are merged based on a (standard) multiscale fusion algorithm. The novelty of our approach lies in the proposed pipeline, but also in the definition of a white-balancing algorithm that is suited to our underwater enhancement problem

 

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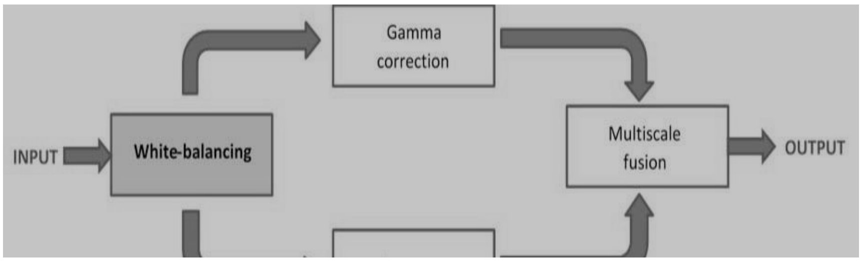


## UNDERWATER WHITE BALANCE

As depicted in Fig. 1, our image enhancement approach adopts a two step strategy, combining white balancing and image fusion, to improve underwater images without resorting to the explicit inversion of the optical model. In our approach, white balancing aims at compensating for the color cast caused by the selective absorption of colors with depth, while image fusion is considered to enhance the edges and details of the scene, to mitigate the loss of contrast resulting from back-scattering. The fusion step is detailed in Section IV. We now focus on the white-balancing stage.

White-balancing aims at improving the image aspect, pri-marily by removing the undesired color castings due to various illumination or medium attenuation properties. In underwater,

### *A. Light Propagation in Underwater*

For an ideal transmission medium they received light is influenced mainly by the properties of the target objects and the camera lens characteristics. The comprehensive studies of McGlamery and Jaffe have shown that the total irradiance incident on a generic point of the image plane has three main components in underwater mediums: direct component, forward scattering and back scattering. The direct component is the component of light reflected directly by the target object onto the image plane.

The existing underwater dehazing techniques can be grouped in several classes. An important class corresponds to the methods using specialized hardware. For instance, the divergent-beam underwater Lidar imaging (UWLI) system uses an optical/laser-sensing tech-nique to capture turbid underwater images. Unfortunately, these complex acquisition systems are very expensive, and power consuming.

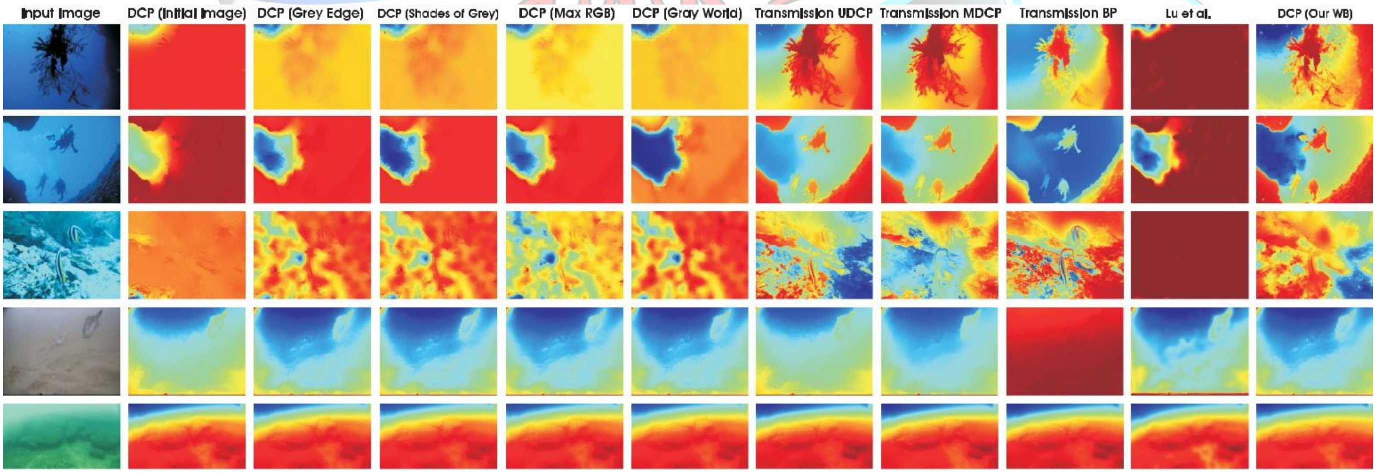


Fig. 5. Underwater transmission estimation,the transmission map is estimated based on DCP applied to the initial underwater images but also from versions obtained with several well-known white balancing approaches (Gray Edge , Shades of Gray, Max RGB and Gray World ) yield poor estimates

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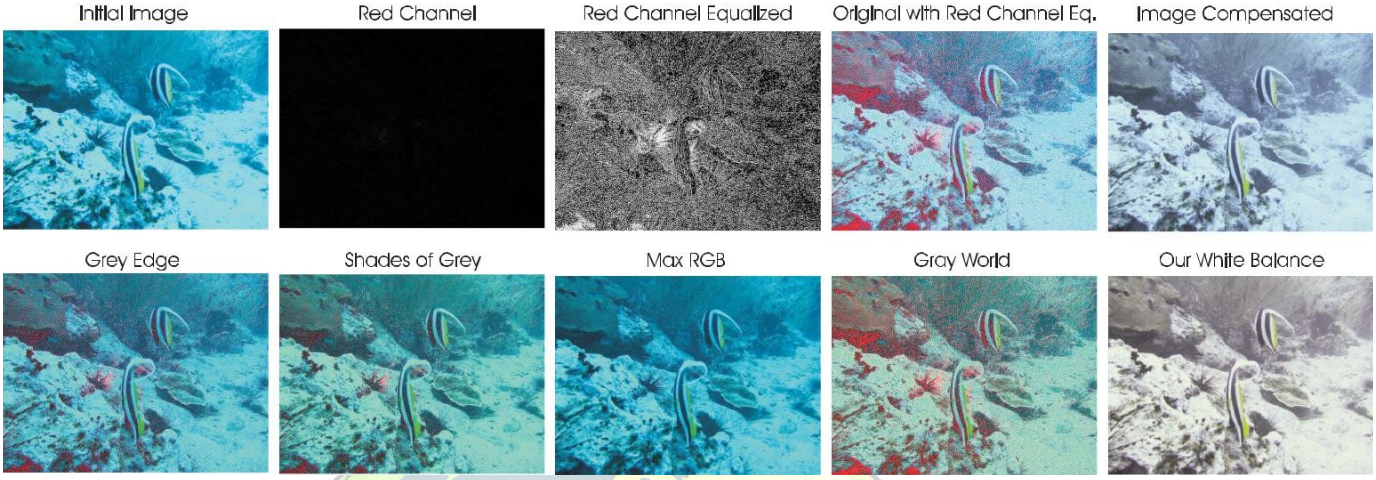


Fig:3 Underwater white-balancing. Top row from left to right: initial underwater image with highly attenuated red channel, original red channel and red channel after histogram equalization, original image with the red channel equalized and the image after employing our compensation expressed.

## CONCLUSION

We have presented an alternative approach to enhance underwater videos and images. Our strategy builds on the fusion principle and does not require additional information than the single original image. We have shown in our experiments that our approach is able to enhance a wide range of underwater images (e.g. different cameras, depths, light conditions) with high accuracy, being able to recover important faded features and edges. Moreover, for the first time, we demonstrate the utility and relevance of the proposed image enhancement technique for several challenging underwater computer vision applications.

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