

ABSTRACT

Underwater image/video normally suffers from several problems such as low color and contrast, inhomogeneous illumination, blue-green illumination, and under- and over-enhanced areas. To solve these problems, integration of a few methods should be implemented and applied to the image/video. The proposed method modified the integration of emphasis homomorphic filtering and image fusion to address these problems. Emphasis homomorphic filtering is equipped with the ability to reduce inhomogeneous illumination in an image by increasing the high frequency image signals and reducing or removing low frequency unwanted illumination. Further, the image is applied with histogram matching to increase the influence of inferior color channel while decreasing the dominant color channel. This will automatically balances the color percentages of the image/video. The image/video is further processed through enhanced dual-images fusion to improve the overall image contrast and increases the saturation and brightness of the image/video. Finally, the input image/video will go through contrast limited adaptive histogram specification to improve the image contrast locally and reduces the effect of under- and over-enhanced areas. Quantitative and qualitative results prove that the proposed method has outperformed the other state-of-the-art methods in terms of contrast and image detail. Nevertheless, the aforementioned problems have been significantly reduced.

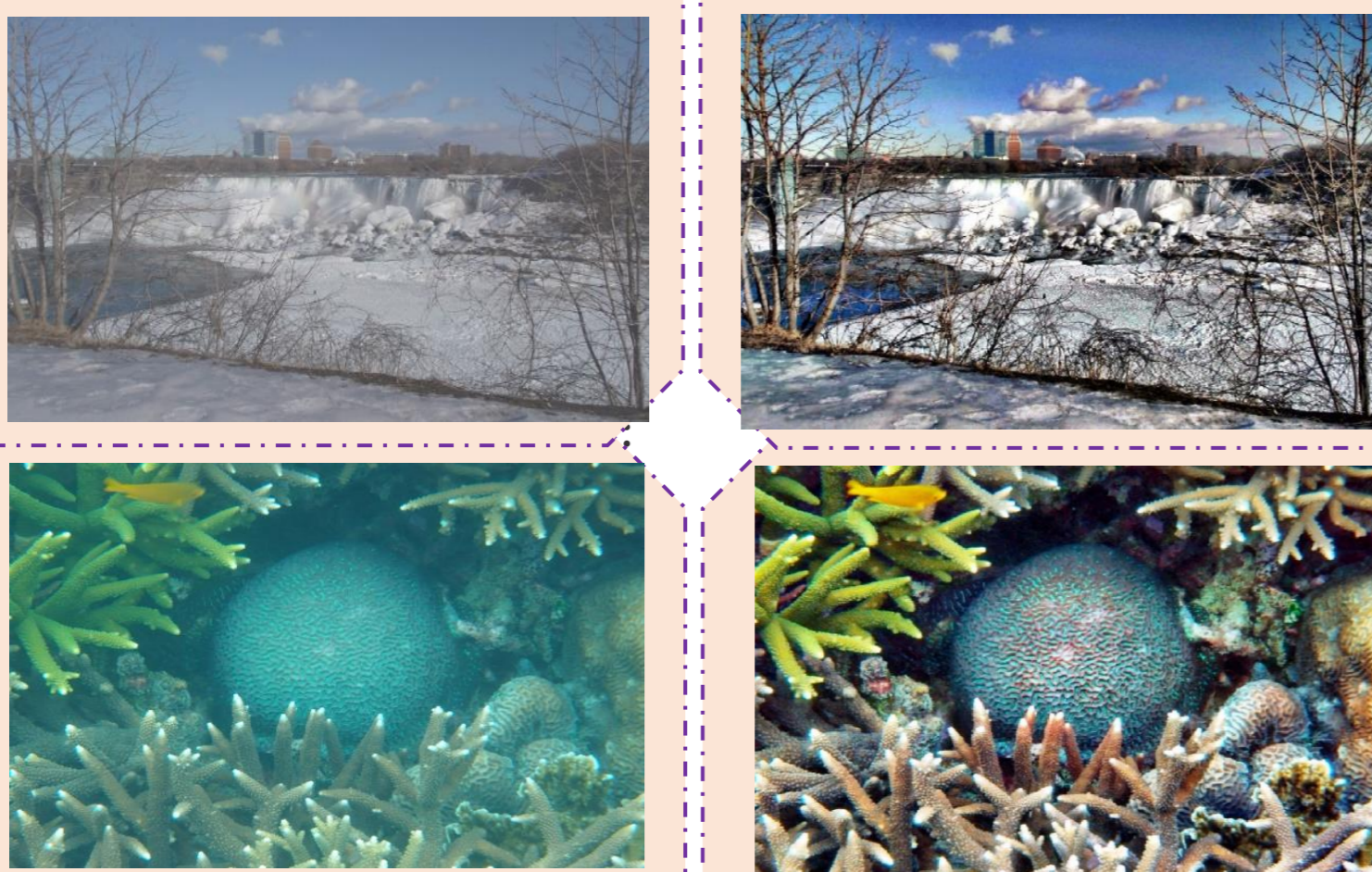
OBJECTIVE

- ✓ To improve the uniformity of underwater illumination
- ✓ To improve the underwater image/video contrast and color by integration of under- and over-enhanced image
- ✓ To improve the global and local image contrast

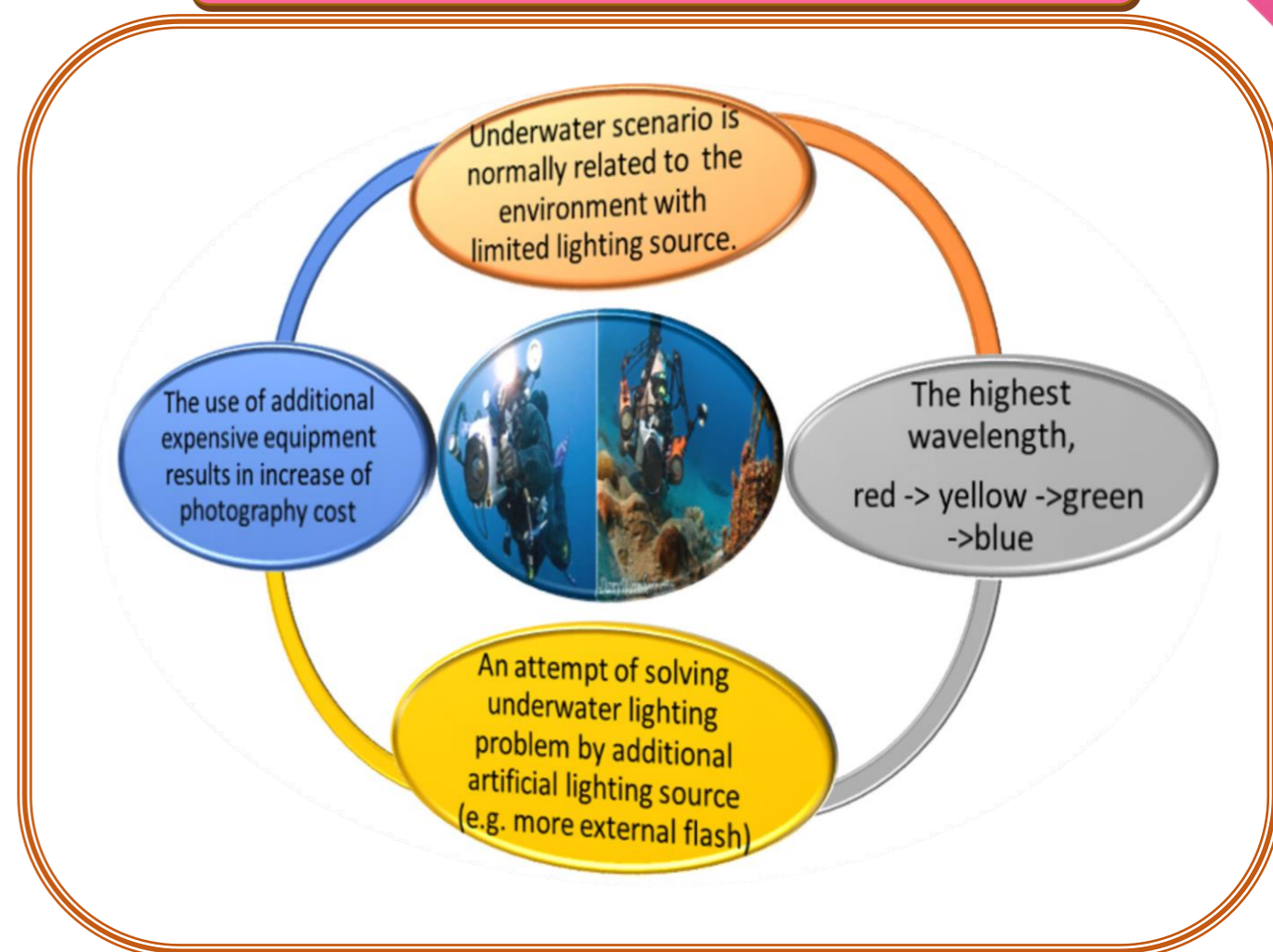
ADVANTAGES

- ▶ Easy coder to enhance underwater image/video for a better contrast
- ▶ Reduce cost of underwater photography
- ▶ Effective in improving underwater image/video color and contrast
- ▶ Applicable for underwater and normal images
- ▶ User friendly – automatic enhancement
- ▶ Equipped with global and local enhancement

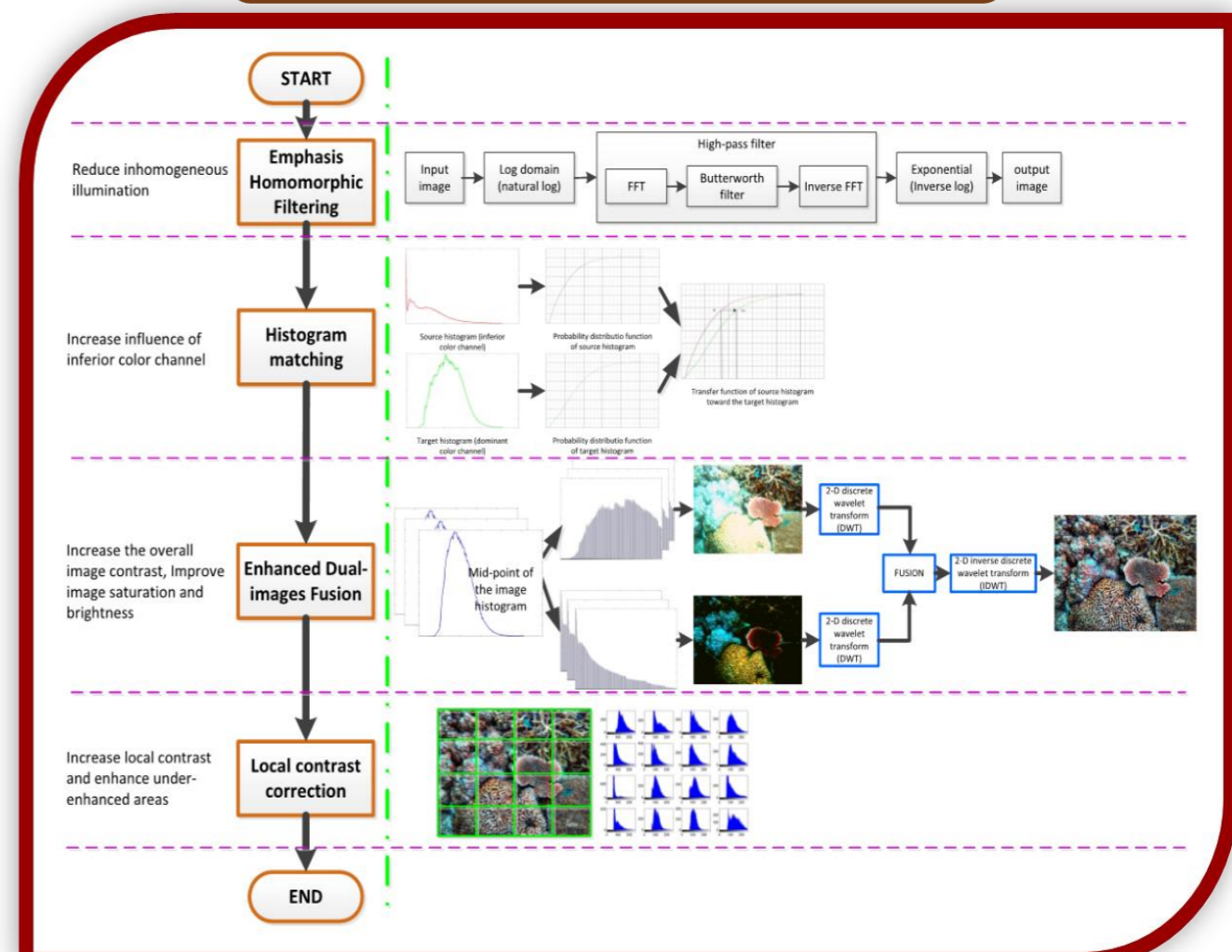
RESULTS



PROBLEM STATEMENT



INVENTIVE STEPS



COMMERCIAL

- ▶ Application in still camera/video camera
- ▶ Underwater robot, unmanned underwater vehicle (UUV)
- ▶ Low-cost application (program/software based application)

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