

COLOR CORRECTION AND ENHANCEMENT FOR UNDERWATER IMAGE USING FUSION TECHNIQUES

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INTRODUCTION

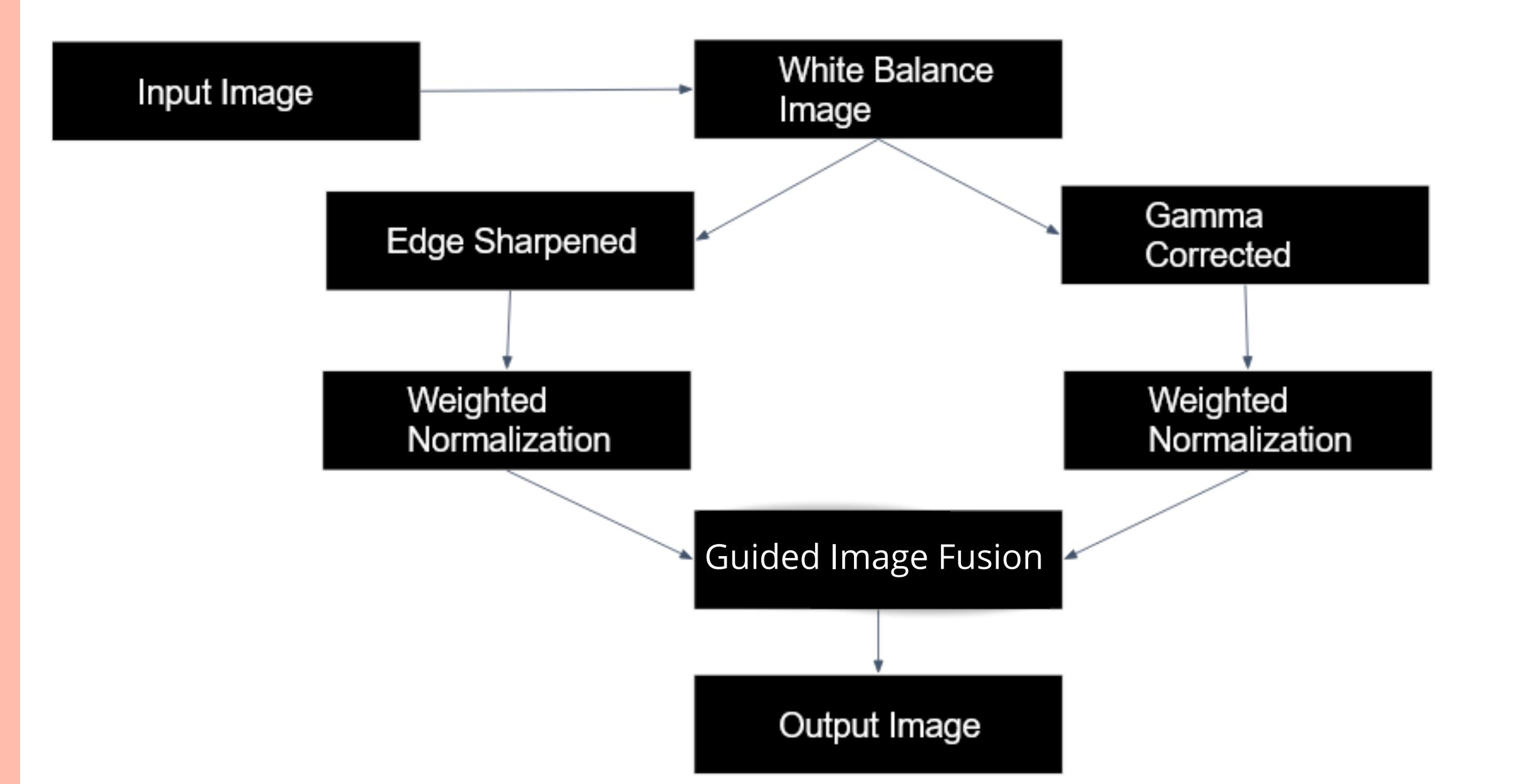
Underwater images play a key role in ocean exploration, but often suffer from severe quality degradation due to light absorption and scattering in water medium. Our project aims towards enhancing the image quality using fusion techniques.

Our method builds on the blending of two images that are directly derived from a color-compensated and white-balanced version of the original degraded image. The two images to fusion, as well as their associated weight maps, are defined to promote the transfer of edges and color contrast to the output image.

DATASET

Underwater Image Enhancement Benchmark (UIEB) dataset includes two subsets: 890 raw underwater images with corresponding high-quality reference images; 60 challenging underwater images [1].

FLOW CHART



FUSION

We propose a simple and fast fusion algorithm : Multi-scale Guided Image and Video Fusion. A Fast and Efficient Approach based on guided image filter. The proposed method can well combine useful source image information into the fused image supported by multi-scale image decomposition,structure transferring property, visual saliency detection, and weight map construction.



This is an example of the
corresponding Reference image



This is an example of Raw image

Reference image

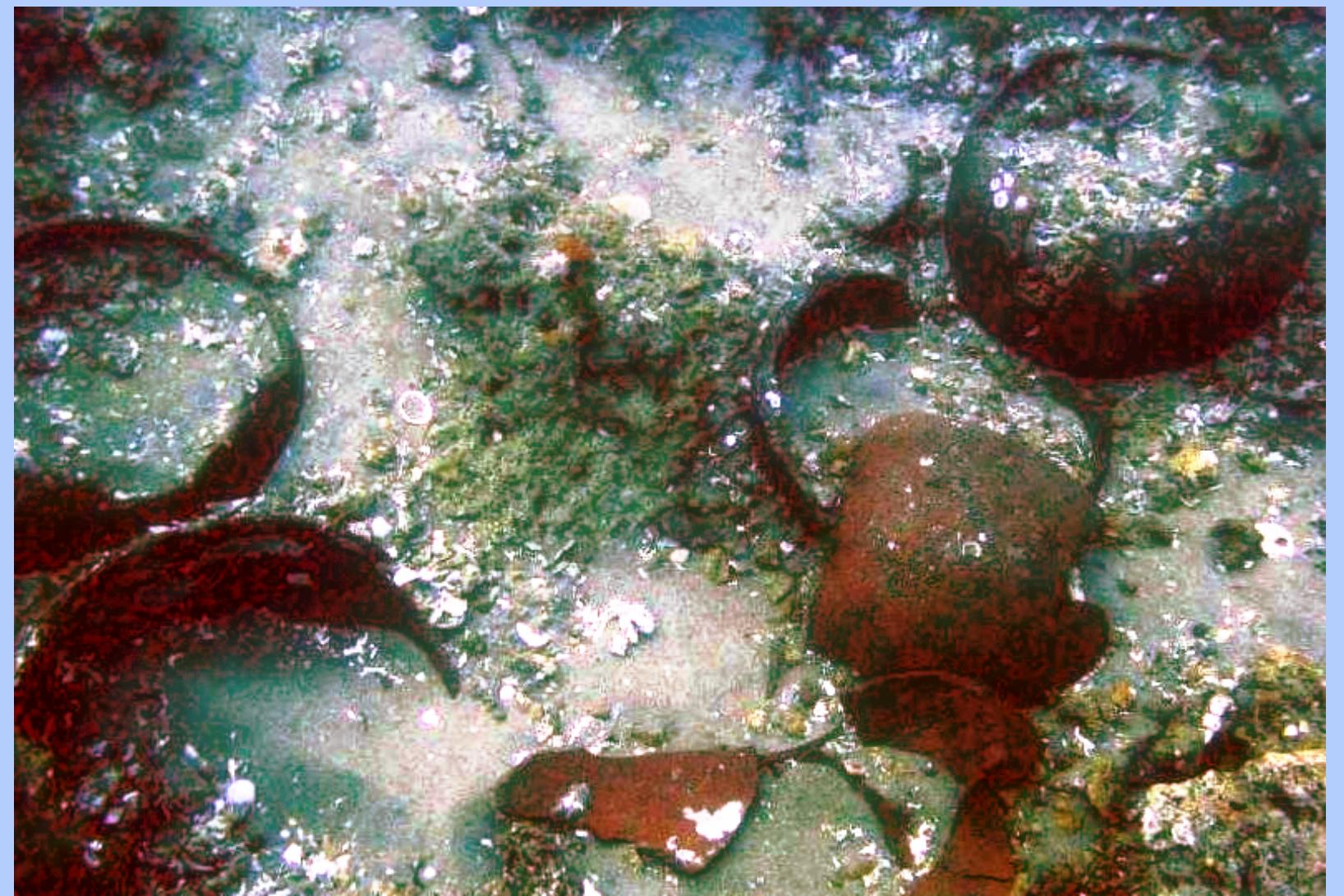


Image generated by our model



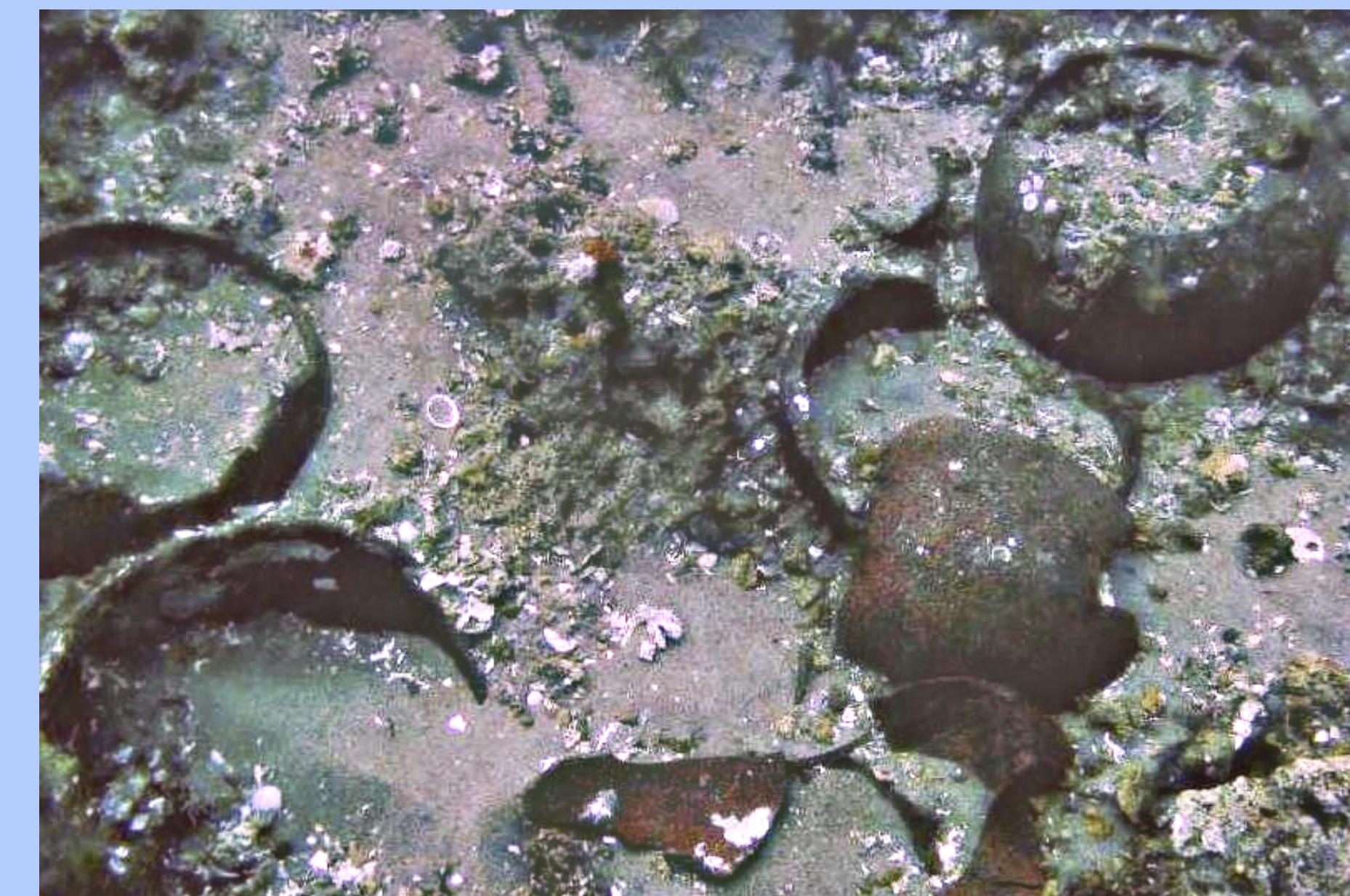
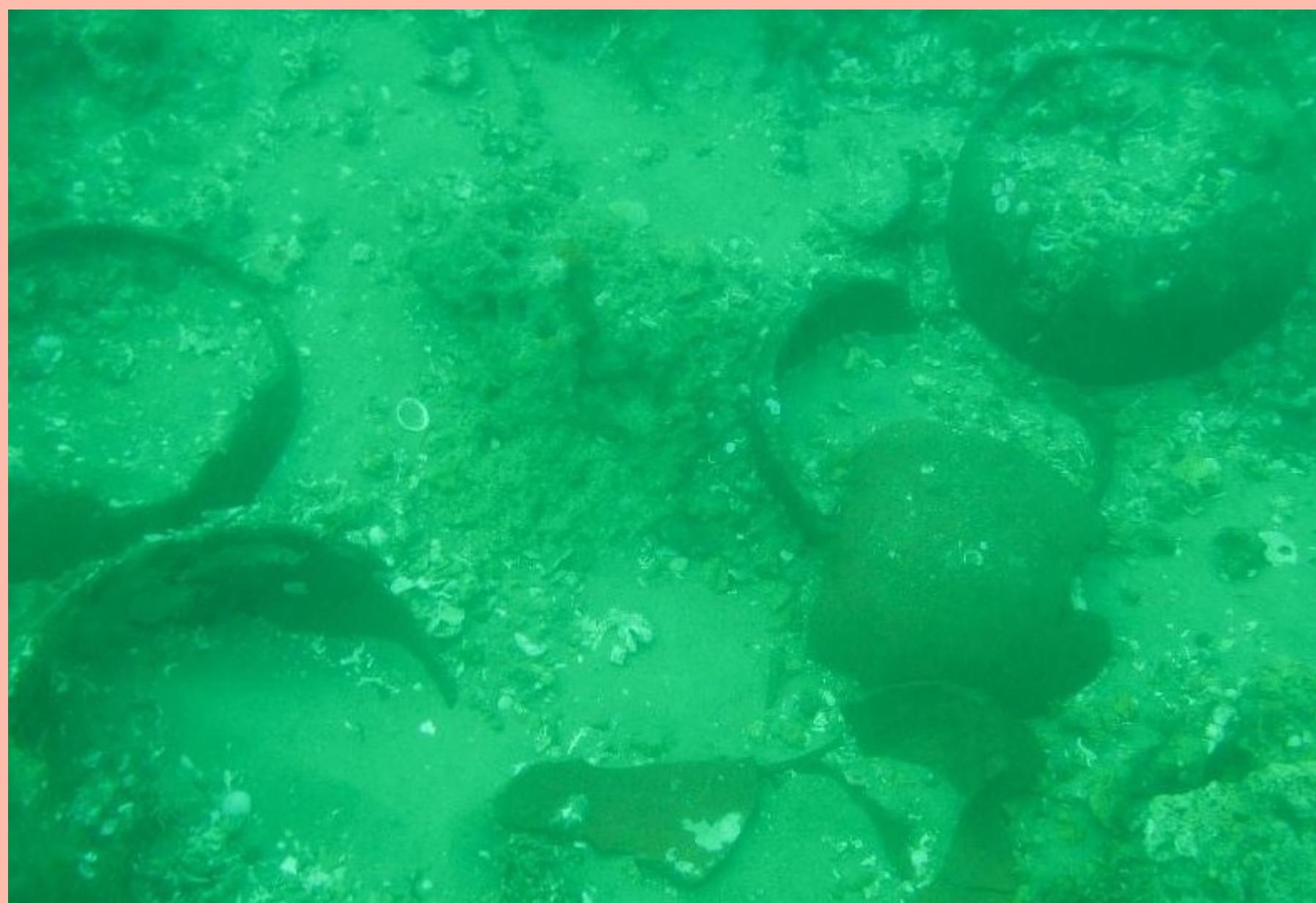


This is an example of the
corresponding Reference image



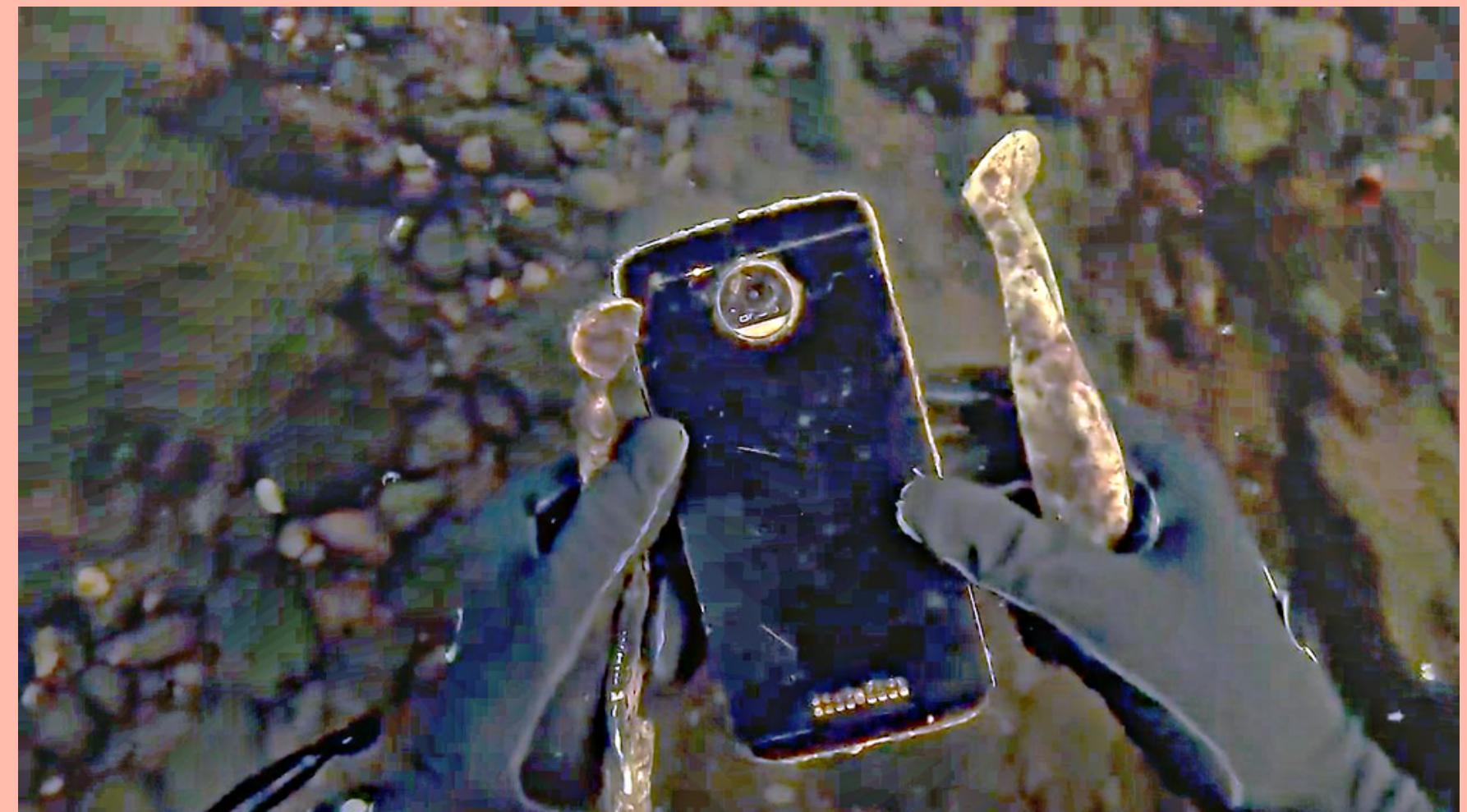
This is an example of Raw image

Image generated by our model









BASE PAPER

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Color Balance and Fusion for Underwater Image Enhancement

We introduce an effective technique to enhance the images captured underwater and degraded due to the medium scattering and absorption. Our method is a single imag...

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REFERENCE

[1] C. Li, C. Guo, W. Ren, R. Cong, J. Hou, S. Kwong, D. Tao, "An Underwater Image Enhancement Benchmark Dataset and Beyond," IEEE Trans. Image Process., vol. 29, pp.4376-4389, 2019.

[2] C. O. Ancuti, C. Ancuti, C. De Vleeschouwer and P. Bekaert, "Color Balance and Fusion for Underwater Image Enhancement," in IEEE Transactions on Image Processing, vol. 27, no. 1, pp. 379-393, Jan. 2018, doi: 10.1109/TIP.2017.2759252.