UGAN: Underwater Image Restoration using Generative Adversarial Networks

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***Abstract*—Autonomous underwater robots often rely on visual input for decision making due to its non-intrusive and passive nature . However, due to many factors such as light refraction, particles in the water, and color distortion, images are often times very noisy. This paper propose a method using Generative Adversarial Networks (GANs) to denoise underwater images, and show that these images provide both increased accuracy for an underwater tracking algorithm, as well as a more visually appealing image. Furthermore, we show how recently proposed methods are able to generate a dataset for the purpose of underwater image reconstruction.**

I. Introduction

Vision is a commonly used sensor in autonomous underwater robots due to its non-intrusive, passive, and energy effecient nature. Despite these advantages, many underwater environments can be quite noisy due to light refraction, blue or green hues, and particles present in the water. Much of this noise comes from color distortion, where images have green or blue haze which may cause difficulty in tasks such as segmentation, tracking, or classification. Algorithms that have been shown to work well on images not underwater may fail due to their indirect or direct use of color. While there have been many recent approaches towards colorization using deep learning [2], [3], [4], [5], they

II. Related Work

III. Method

A. Generative Adversarial Networks

B. Objective

C. Network Architectures

1) Generator:

2) Discriminator:

IV. Conclusion

Acknowledgment

References

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