

# **A PREPROCESSING FRAMEWORK FOR AUTOMATIC UNDERWATER IMAGES DENOISING**

**Par Andreas ARNOLD-BOS**

## **Abstract**

A major obstacle to underwater operations using cameras comes from the light absorption and scattering by the marine environment, which limits the visibility distance up to a few meters in coastal waters. Current preprocessing methods typically only concentrate on local contrast equalization in order to deal with the nonuniform lighting caused by the back scattering. We review these techniques, then go further and show that the additional use of adaptive smoothing helps to address the remaining sources of noise and can significantly improve edge detection in the images. Many results on real data are provided and discussed using a custom numerical criterion.

**Keywords:** underwater vision, denoising, contrast equalization, adaptive smoothing.