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Advanced Computing and Communications 2012

IJCA Proceedings on National Conference on

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NCACC - Number 1

Year of Publication: 2012

Authors:

Prabhakar C J

Praveen Kumar P U

{bibtex}ncacc1010.bib{/bibtex}

Abstract

In this paper, we propose a novel technique to reconstruct 3D surface of an underwater object using stereo images. Reconstructing the 3D surface of an underwater object is really a challenging task due to degraded quality of underwater images. There are various reasons of quality degradation of underwater images i. e. , non-uniform illumination of light on the surface of objects, scattering and absorption effects. Floating particles present in underwater produce Gaussian noise on the captured underwater images which degrades the quality of images. The degraded underwater images are preprocessed by applying homomorphic, wavelet denoising and anisotropic filtering sequentially. The uncalibrated rectification technique is applied to

preprocessed images to rectify the left and right images. The rectified left and right image lies on a common plane. To find the correspondence points in a left and right images, we have applied dense stereo matching technique i. e. , graph cut method. Finally, we estimate the depth of images using triangulation technique. The experimental result shows that the proposed method reconstruct 3D surface of underwater objects accurately using captured underwater stereo images.

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Computer Science

Index Terms

Image Processing

Keywords

3d Reconstruction Underwater Stereo Images Uncalibrated Rectification Graph Cut
Triangulation