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UNDERWATER OBJECT IDENTIFICATION USING MATLAB AND MACHINE

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Abstract – *The purpose of the underwater image processing as earned great awareness within the last decades, by showing important attainments. In this paper we survey some of the most recent techniques that have been particularly refined for the underwater setting. These techniques are capable of broadening the range of underwater imaging, enhancing image contrast and resolution. After evaluating the fundamental physics of the light propagation in the water fair, we focus on the various process available in the literature. The conditions for which each of them have been Initially formulated are called attention as well as the quality assessment methods used to evaluate their performance and to find the underwater object using MATLAB and machine learning by capturing image using (C270 HD) Camera in 30 frames per second of the movement of the image and any disturbance in image like noise that will converted grey to black by pre-processing method By extracting the feature extraction according to its type of mammals and detect the object and store it in cloud.*

Key Words: **Underwater image, Colour correction, image enhancement**

1. INTRODUCTION

Underwater objects are the objects that rise above the bottom surface more than a specific amount as defined by IHO survey standards. Object detection normally acquires long time processing and analysis by human experts. Side scan automatic processing software packages in object recognition field (which is one of the main functions of hydrographic survey) yield obvious discrepancies. This can be referred to the differences in shapes and sizes of submerged and buried objects (such as pipelines, rocks, and Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template will do that for you, ship's wreck). Physical samples should be gathered at spacing dependent on the seabed geology and as required to ground truth any inference technique. The absorption of light by water is selective: the absorption rate of red light is higher, whereas the transmission rate of blue and green light is better. Accordingly, natural underwater images are primarily blue or green, dissimilar that of an in-air image [1]. The scattering of light in water can be divided into two types: forward scattering and backward scattering [1]. While the conducting a local search, s-sonar tries to specify the objects. The object of attention in this paper is synthetic landmarks that is designed to be effectively distinguished by the imaging sonar [3].By capturing image we convert grey to black by color conversion method, if there is any noise in the picture, by cleaning and get clear image and with feature extraction we will find what type of mammals and identify the object and store that data in cloud by using hardware NodeMCU (MICROCONTROLLER UNIT). This method has many data and high accuracy, but because of the incapacity to have the perfect conditions of the laboratory in the bad underwater environment, the experimental method is less operational [2]. Underwater images are virtually characterized by their poor vision because light is exponentially attenuated as it travels in the water and the scenes result badly varied and uncertain. Light attenuation results the perception distance at about twenty meters in clear water and five meters or less in contaminated water. The light attenuation process is caused by absorption (which reduce light energy) and dispersing (which changes the guidance of light path). The absorption and dispersing processes of the light in water impact the overall performance of underwater mirroring systems.

1.1 literature survey

1.Underwater Robot Exploration and Identification Using Dual Imaging Sonar: (Basin Test) is proposed by Yeongjun Lee, Jinwoo Choi and this method that can be applied to the underwater robot exploration in consideration of the search range and image quality of the image sonar, and verify its usefulness

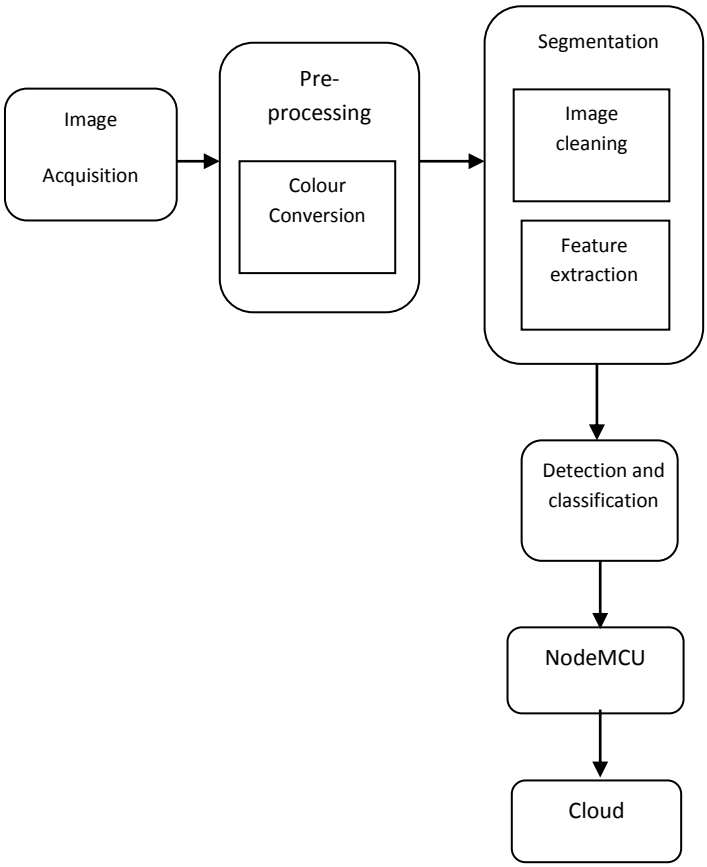
through the integrated experiments with the underwater robots-2017

2. Color correction of underwater image based on Multi-Illuminant estimation with exposure bracketing imaging proposed by Kohei Nomura, Daisuke Sugimura this method is for colour correction of underwater images based on multi-illuminance estimation. In order to effectively remove the colour distortions from underwater images, by using an exposure bracketing imaging. And multiple images taken with different exposure times, then fused an image where the attenuation difference in the spectral information of the incoming light are mitigated. And finally applied a multi-illuminance estimation to the fused image to remove the colour cast from the underwater image-2017

3. Underwater Image Restoration Based on Improved Background Light Estimation and Automatic White Balance is proposed by Changli Li, Xuan Zhang To overcome the shortcomings of classical dark channel prior algorithm, an underwater image restoration algorithm based on improved background light estimation and automatic white balance is proposed. The improved background light estimation method can reduce the influence of light and white objects in the water and improve the accuracy of the background light. The improved automatic white balance algorithm can reduce the colour distortion and get a clear image with the colour correction of the restored image. According to the contrast experiments of four different underwater images, we can see that the algorithm has some advantages on subjective and objective evaluation indexes, and the sharpness and the colour fidelity of the enhanced image are better-2018

3. Underwater Image Enhancement with a Deep Residual Framework proposed by Peng Liu, Guoyu Wang This paper proposes an underwater image enhancement solution by a deep residual framework. Firstly, CycleGAN was employed to generate synthetic underwater images as training data for the CNN models. Secondly, the super-resolution reconstruction model VDSR was introduced into the field of underwater image enhancement, and the residual learning model, Underwater Resnet (UResnet) was proposed methods can significantly improve the visual effects of underwater images, which are helpful to the implementation of vision-based underwater tasks, such as segmentation and tracking. Furthermore, we consider applying the proposed methods to the similar domains, such as image dehazing and super-resolution reconstruction to test the generality of the proposed methods. We leave these to our future work. -2019

2. SYSTEM DESIGN



3. METHODOLOGY

sonar dataset is a format convertion of the acquired XYZ data to 3D image by creating triangles (TIN surface) to join these points and represent them as three dimensional surface, Converting 2D image to 3D image. Feature extraction by representing with shape vector. Object recognition using nearest geometrical shape. Validation phase using simulation data.

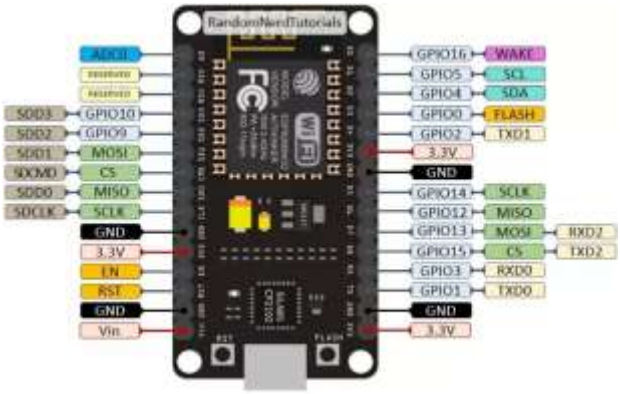


Figure 3.1 NodeMCU

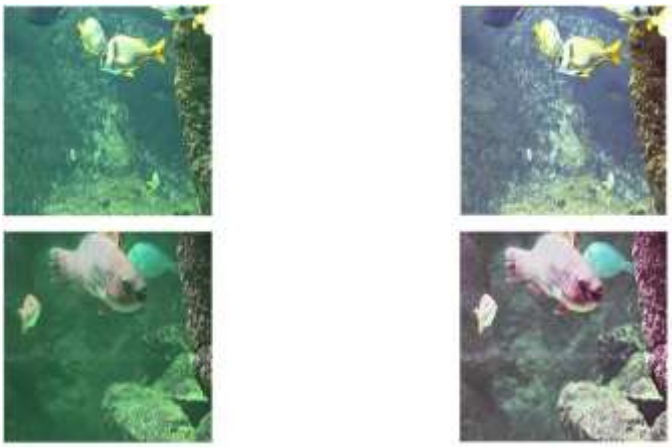
In Image acquisition the image digitally encoded representation of the visual characteristics of an object, Pre-processing is an improvement of the image data that suppresses unwanted distortions or enhances some image, Histogram Equalization is a computer image filtering method used to improve difference in images. Logitech C720 HD camera is capturing the object in underwater in 30 frames per second with 1280 x 720 pixels. HD video recording and photos are taking at the maximum resolution of 2048 x 1536 pixels in 4:3 format. Image Classification helps us to classify what is included in an image. Image Localization will specify the area of single object in an image whereas Object detection specifies the location of multiple objects in the image. Finally, Image segmentation will create a pixel wise cloak of each object in the images. Communication of MATLAB to Arduino by Wi-Fi with an ESP8266 Wi-Fi chip.

Figure 3.2 Logitech C720

4. CONCLUSIONS

This paper proposes an underwater image enhancement solution by a deep residual framework of an image using MATLAB software with the help of NodeMCU and getting the high quality of an image

Removing green and blue colors from the picture and get the highly contrast image of the fish and finding which type of fish with the help of NodeMCU and send the data's to cloud and send via notification



5. Result

Finally the output of the image is in different formats of images has classified as real image and enhanced image.

Figure 4.1 output image enhancement

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