**Underwater Image Enhancement using CLAHE**

**Abstract:**

In recent years, underwater images have been widely used in marine energy exploration, marine environment protection, marine military, marine life research and other fields. In these applications image acquisition is carried at varied depths of water, an artificial light is used to capture the underwater object. The physical properties of the water make light behave differently, changing the appearance of a same object with variations of depth, organic material, currents, temperature etc. This results in colour distorted images and hazy images with very low contrast. Hence, there is a need to enhance the underwater images in light of the above applications.

Aim of this project is to enhance the underwater images which are affected by color distortion, contrast reduction and haziness. Initially, the original image is pre-processed by the white balance algorithm for colour correction. White balance algorithm involves the process of removing unrealistic colour casts in an underwater image. This colour corrected image is treated with dark channel prior dehazing method to obtain contrast enhancement. These two input images viz., i. Colour corrected and ii. Contrast enhanced are further processed by multiscale fusion strategy. Multiscale fusion strategy entails the restoration of image which is based on the weighted maps constructed by combining the features of global contrast, local contrast, saliency, and exposedness. Experimentation can be carried out on standard database RUIE of 400 images and U45 dataset to evaluate the performance of this approach in terms of mean square error, peak-signal-to-noise-ratio. The Proposing methodology in this project can be utilized to enhance the underwater images by using **MATLAB** Software. Further these enhanced images can be used for various applications such as consumer underwater photography, marine life research, and underwater exploration.

**Methodology of the Project:**

**Step 1: Literature Survey**

* Collection of research papers from peer reviewed journals, articles, thesis etc.
* Performing a brief study on various methodologies employed

**Step 2: Modelling and Simulation**

* Modelling of the design concept in the Matlab Software.

**Step 3: Preparation of report on proposed work**

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