VISVESVARAYA TECHNOLOGICAL UNIVERSITY
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A PROJECT REPORT ON

UNDERWATER IMAGE CLARIFICATION BASED ON RGHS AND ULAP

Submitted in partial fulfilment for the award of Degree of,

BACHELOR OF ENGINEERING

IN

INFORMATION SCIENCE AND ENGINEERING

By

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CERTIFICATE

This is to certify that the project entitled **"UNDERWATER IMAGE CLARIFICATION BASED ON RGHS AND ULAP"** has been successfully completed by

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the bonafide students OF **DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING, Alva's Institute of Engineering and Technology**, Moodbidri affiliated to **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the academic year 2023–24. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed in partial fulfillment of awarding Bachelor of Engineering degree.

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ABSTRACT

Underwater images typically exhibit color bias and low contrast due to the absorption and scattering effects of light propagating in water. Traditional underwater image restoration and enhancement methods generally require long computation times with unsatisfactory results. In this study, a new underwater image enhancement method is proposed involving RGB Histogram Stretching (RGHS) and Underwater Light Attenuation Prior (ULAP). The proposed method RGB histogram stretching and LAB color space stretching to each image. RGB histogram stretching enhances the global contrast of the images by stretching the range of color values. LAB color space stretching balances the color distribution across the LAB color space, which is designed to approximate human vision. The output of this stage is a set of images that are ready for further processing and ULAP estimates the depth map of each pre-processed image. The depth map represents the distance of the objects in the scene from the camera, which is a crucial factor in underwater image enhancement. The results show that the proposed method outperforms traditional methods in terms of both image quality.