

**COLOUR CORRECTION MODEL IN DEEP LEARNING FOR FISH HABITAT MONITORING**

**W.M.E.Y. Sarathchandra<sup>1\*</sup>, R. Siyambalapitiya<sup>1</sup> and C.S. Munasinghe<sup>2</sup>**

<sup>1</sup>*Department of Statistics and Computer Science, Faculty of Science,  
University of Peradeniya, Sri Lanka*

<sup>2</sup>*Department of Zoology, Faculty of Science, University of Peradeniya, Sri Lanka*

*\*sarathchandra.erandi@gmail.com*

This study investigated the use of deep learning techniques for fish habitat monitoring, focusing on the impact of a Colour Correction Model (CCM) on underwater imagery. The primary objective was to assess whether the CCM can enhance the performance of the You Only Look Once (YOLOv8m) framework in fish species classification and marine environment assessment. The results reveal that the integration of the CCM does not enhance the performance of the YOLO framework. While the CCM improved image clarity and fidelity, the classification accuracy increased only marginally from 65% to 66%, and metrics such as precision, recall, and F1-score showed minimal improvement. Subsequent models, including YOLO and TensorFlow, do not exhibit significant improvements in classification accuracy. The evaluation of various deep learning models was rigorously conducted, highlighting the strengths of each model and the challenges addressed in marine habitat monitoring. While training and validation loss were effectively reduced by the CCM, this did not translate into improved performance metrics for fish classification. These findings underscore the complexity of underwater imagery and the need for further refinement in preprocessing techniques. This research contributes a nuanced understanding of the role of colour correction in deep learning applications for environmental monitoring. Future work should focus on exploring alternative preprocessing methods and integrating more sophisticated deep learning architectures to enhance classification outcomes. Despite setbacks, the potential for advanced deep learning models to revolutionize marine biology remains significant, promising valuable contributions to the preservation and understanding of marine ecosystems.

**Keywords:** Colour correction model, Environmental conservation, Fish habitat monitoring, Underwater imagery