

ABSTRACT

This study develops a tuna species classification system based on YOLOv8 integrated with IoT devices such as underwater cameras to support real-time detection with high accuracy. Tuna, as a valuable economic commodity, faces threats from overfishing and environmental changes. This system is designed to improve the efficiency and accuracy of tuna species classification, supporting the sustainable management of marine resources.

The research stages include a review of object detection algorithms, collection and preprocessing of tuna species data, and training and optimization of YOLOv8 for high speed and accuracy on resource-constrained devices. The model was tested in real-world conditions using an underwater camera, with performance evaluated based on metrics such as F1-Score and mAP. Results show that the system can achieve accuracy above 85% with processing times suitable for real-time monitoring.

Keywords: tuna, yolo, deep learning, fish classification, IoT, conservation