

ToroCam: A smartphone application for rapid collection of total length data required for fish stock assessment

Production

Demonstration

Item: Fisheries

Resource management

Outline

An application called ToroCam was developed to record the total length (TL) of fish by capturing images on a smartphone. The app allows users to collect TL data without manually measuring fish, leading to a substantial reduction in labor time.

Background/effect/note

To enhance the accuracy of stock assessments and reduce the workload of surveyors, we developed an application called ToroCam, which allows users to collect TL data by photographing fish catches using a smartphone (Reference 1). ToroCam is freely available on Google Play. To use ToroCam, the user aligns a fish box within the frame displayed on the screen (Fig. 1) and captures a photo. The image is transferred to a PC, where the number of pixels representing the fish's body area (Fig. 2) is automatically calculated using deep learning model. The frame in the image serves as a reference scale, enabling the extraction of the TL (cm) (Fig. 3). ToroCam can be used in ports and fishing villages where power and secure conditions may not be guaranteed, as long as a smartphone is available. Only one PC is required at a central location where the images are aggregated. Compared with similar technologies, this app does not require expensive equipment, making it a useful tool for efficiently collecting data for stock assessments, even in small-scale ports and villages.



Fig. 1. A capture scene using ToroCam

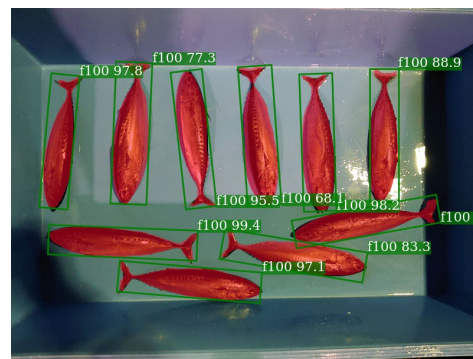


Fig. 2. Detection of the fish body area. The label 'f100' indicates that the fish is not overlapped by other fish, and the numbers represent the confidence level of the label

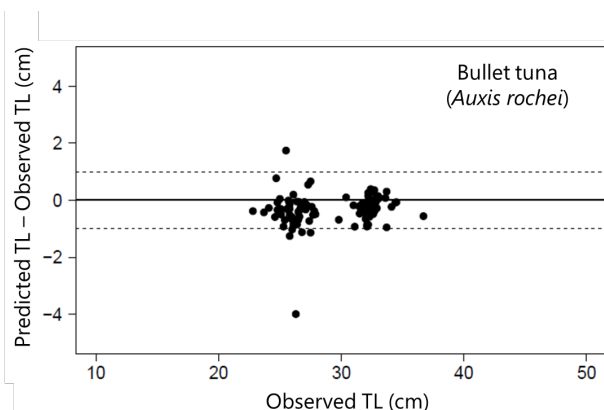


Fig. 3. Difference between the predicted and observed total length (Adapted and reproduced from Shibata et al., 2024)

Technical details:



Reference 1

<https://www.sciencedirect.com/science/article/abs/pii/S0165783624000341>

A smartphone application: ToroCam

<https://play.google.com/store/apps/details?id=jp.co.compmind.fiasd.torocam>

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