

CodSpotter

Friday 10 October 2025 13:00 (30 minutes)

Non-invasive monitoring of marine species is critical for sustainable ecosystem management. This study presents a methodology for the individual identification of Atlantic cod (*Gadus morhua*) using natural skin pigmentation patterns. The project addresses the limitations of traditional, often invasive, survey methods by developing a computer-vision-based approach for re-identifying individuals over time. This allows for more accurate data on population dynamics, migratory behaviour, and site fidelity.

The methodology is founded on a robust data acquisition strategy. A substantial video dataset of wild cod has been collected in Northern Norway using Baited Remote Underwater Video Systems (BRUVs). This in-situ footage is supplemented by video from controlled aquarium environments, which will serve as a validation dataset for the developed models.

The data were integrated into a privately and custom-built web application designed to efficiently manage the extensive image datasets generated from the video footage. The application facilitates the annotation and identity verification workflow, which is a prerequisite for training a supervised machine learning model. This tool streamlines the otherwise laborious process of creating a large, accurately labelled dataset of individual cod, enabling efficient curation and review by researchers.

The subsequent phase of the project involves training a Convolutional Neural Network (CNN) to automatically re-identify individual cod from images based on their unique spot patterns. The model's performance will be quantitatively assessed using the validation dataset from the aquarium footage, where individual identities are known. The goal is to develop a reliable, non-invasive tool that can be integrated into long-term monitoring programs, thereby contributing to more effective conservation and management strategies for this commercially and ecologically vital species.

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