Fish Detection and Classification Through Deep Learning

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Abstract

The classification of fish species is an important task in the fishing industry. However, classifying fish manually is labor-intensive and prone to errors. This project proposes a machine learning-based classification model to automate fish species identification. By leveraging computer vision and a diverse dataset of fish images, the model aims to streamline fish classification, reduce costs, and improve accuracy.

1. Introduction

According to a paper [1], over a thousand commercial fishing vessels are equipped with electronic monitoring (EM) systems, which utilize onboard cameras to monitor fishing activities and ensure accountability in the global seafood industry. These systems generate vast amounts of video data that are analyzed by trained human reviewers. In the coming decade, the number of vessels using electronic monitoring systems is projected to increase by 10 to 20 times, surpassing the current capacity for data review.

There are a lot of fish datasets that are of high quality and well-documented. We will train our model in different datasets to compare their performance. We have found the following datasets: Fishnet.AI, A Large Scale Fish Dataset, and Fish Dataset.

We would utilize some popular pre-trained models to facilitate the project. After that, we will compare the results and evaluate the performance of various models trained by different datasets. The main performance measure is the model's accuracy in correctly identifying fish species from images. Additionally, we will evaluate its accuracy in comparison to existing fish classification models.

References

[1] Justin Kay and Matt Merrifield. The fishnet open images database: A dataset for fish detection and fine-grained categorization in fisheries, 2021. 1