

NEMO: ML based fish species classification

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Abstract:

This paper describes the creation of an ML-based tool for image-based identification of fish species commonly found in Indian oceans, addressing the issues that fishermen experience in accurately reporting their catch. Motivated by the Smart India Hackathon (SIH) issue statement from the Indian National Centre for Ocean Information Services (INCOIS), our goal is to improve marine fishing advice services. We developed a dataset that includes photos of 21 fish species typically captured by Indian fishermen, precisely chosen to ensure clarity and little background noise. Using this dataset, we applied transfer learning to eight different pre-trained models to determine the most effective one for deployment in a mobile application. The Kotlin-developed program has an easy-to-use interface with catch history, fish nutritional values, and pertinent weather data. Our findings show that the installed models can correctly recognize fish species, with MobileNetV2 reaching a peak accuracy of 97.61%. In addition to expediting the species identification process, this cutting-edge tool provides fishermen with crucial information, which eventually leads to more accurate species-level catch reporting.

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I. Introduction

Millions of Indians depend on the fishing sector for their livelihoods, and it plays a major role in ensuring food security. Despite its significance, it is still difficult to accurately report fish catches at the species level for a number of reasons, such as ineffective identification and reporting errors. By using species-specific capture data, the Indian National Centre for Ocean Information Services (INCOIS) seeks to increase the precision of marine fishery warnings. Current reporting techniques, however, frequently depend on the fishermen's manual

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