FISH DETECTION AND CLASSIFICATION USING SUPERVISED MACHINE LEARNING

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ABSTRACT

One of the major challenges with collecting these data is the inherent difficulty associated with accurately measuring the movements of marine animals underwater. The growing demand for marine monitoring calls for robust computerized structures to guide researchers in gathering data from marine ecosystems. The major goal is to realize and hit upon their respective locations. The idea of classification in machine learning is involved with constructing a model that separates statistics into distinct classes. This paper introduced a computationally-inexpensive marine mammal detection and classification algorithm with excessive possibilities of detection and distinct classification. There is a use of a support vector machine active learning algorithm for conducting effective relevance feedback for image retrieval. Here algorithm selects the most informative images to query a user and learns a boundary which separates the images that satisfy the user's query concept from the rest of the dataset.

Keywords: Marine animals, detection, machine learning, support vector machine.

1. INTRODUCTION

Quantifying human impact on fish biodiversity in order to propose solutions to preserve submarine ecosystems is an important line of research for marine ecology. This quantification requires in situ sampling of the fish community. Measurements based on extraction-fishing give only limited data, and could lead to misinterpretation. Moreover, the use of fishing, even for survey purposes, impacts the studied biodiversity. Another standard method consists in two divers who note visual observations of fishes under water. This kind of survey is expensive in both time and money, and results are greatly impacted by divers' experience and fish behavior. Moreover, data acquisition remains limited by the human physical capacities. A more recent method consists in acquiring underwater images, with either a moving or a fixed camera. An expert will then be asked to detect, count and recognize fishes on a screen offline. At the moment, this task is performed entirely manually, and the amount of data is often too large to be completely analyzed on screen. Moreover, the latest technical improvements of HD camera allow recording fish communities for a long time at a very low cost. Significant examples of a huge amount of underwater HD images that have been collected for assessing fish biodiversity. The

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