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Humpback Whale's Flukes Segmentation Algorithms

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Abstract

Photo-identification consists of the analysis of photographs to identify cetacean individuals based on unique characteristics that each specimen of the same species exhibits. The use of this tool allows us to carry out studies about the size of its population and migratory routes by comparing catalogues. However, the number of images that make up these catalogues is large, so the manual execution of photo-identification takes considerable time. On the other hand, many of the methods proposed for the automation of this task coincide in proposing a segmentation phase to ensure that the identification algorithm takes into account only the characteristics of the cetacean and not the background. Thus, in this work, we compared four segmentation techniques from the image processing and computer vision fields to isolate whales' flukes. We evaluated the Otsu (OTSU), Chan Vese (CV), Fully Convolutional

Networks (FCN), and Pyramid Scene Parsing Network (PSP) algorithms in a subset of images from the Humpback Whale Identification Challenge dataset. The experimental results show that the FCN and PSP algorithms performed similarly and were superior to the OTSU and CV segmentation techniques. © 2021, Springer Nature Switzerland AG.

Author keywords

Artificial intelligence; Cetology; Computer vision; Image segmentation; Photo-identification

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