PARAMETER SELECTION IN CENTROID-CONTOUR DISTANCE METHOD FOR CLASSIFICATION OF PUFFERFISH SPECIES

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Abstract

In this study four pufferfish species namely as; *Lagocephalus sceleratus, Lagocephalus spadiceus, Lagocephalus suezensis, Torquigener flavimucolosus* of Tetraodontidae family were classified by using centroid-contour distance based feature extraction method. A database which consists of 42 fish images was used in this study. Each image includes a fish located on a white background floor with the same position. All of the images were taken from different distances. In order to reduce negative environmental conditions before image processing, all images' backgrounds were manually converted to blue. Following that, a combination of automatic image processing algorithms were applied on images to obtain a binary image of the fish sample. The centroids of the fishes were acquired by using the binary images. The distances between centroid and determined points of contour were calculated and were used as feature sets. Starting from the first calculated centroid-contour distance, a degree increment was performed at each time to come at the next contour point. The degree increment was performed in a range of 1 degree to 90 degrees. Due to the variance on number of degree increments, feature sets with different number of features were obtained. For classification purposes, these feature sets used within Nearest Neighbor algorithm separately. Feature sets which obtained from degree increments from 1 degree to 6 degrees were achieved a classification performance of 100% for 42 images from 4 species of Tetraodontidae family. According to these results, 6 degrees increment on centroid-contour distance method provides best classification result with least number of features.

Keywords: Classification, Pufferfishes, Centroid-Contour Distance