

XIII Biofouling, Benthic Ecology and Marine Biotechnology Meeting. 5 - 9 August 2019 - Arraial do Cabo, RJ.

SYSTEM FOR DETECTION AND CLASSIFICATION OF MARINE MAMMALS SOUNDS USING DATA MINING TECHNIQUES

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Observation of marine mammals using visual method aims to record data from the occurrences of animals on the surface. However, this method is difficult to be used, because of most of the time the animals are submerged for long periods and appearances can occur at night. Therefore, the monitoring of marine mammals through undersea acoustic techniques is currently used. Passive Acoustic Monitoring (PAM) is a method used by researchers to study the behaviours of marine mammals. Although acoustic recordings assist researchers with visual techniques, the volume of recorded data is a problem. But the time and number of recordings generate a lot of data. This work aims to present a developing system for detection and classification of marine mammal sounds using a data mining techniques. Based on systems already created and available in the literature, the objective of the work is to create a system that mitigate the problems of extraction of characteristics of the signal contour and also a classifier for the marine mammals of the South Atlantic. The available systems show good detection, however when the system traces the contour automatically, some pieces of the signal are lost. Another characteristic of the systems is that do not provide classifiers for local species (South Atlantic). The system was implemented on Matlab and is divided into three stages: detect, trace outline to extract features and classify. Detection has already been implemented and uses threshold values to detect the start of the signal. The automated contour-tracing function is complex and is in development, with that study the possibility of using image processing with signal processing and neural networks, all so that no piece of the signal is lost. As in existing systems, a manual contouring function has been developed, so it is possible to extract signal characteristics (minimum frequency, maximum frequency, amplitude, signal time, etc.) to be used in the classifiers. The classification of the signals is done using data mining techniques (random forest, clusters, etc.) divided into two stages, training and testing. In this work it will not be possible to show the results of the classifier because the data is still being treated for training the classifier and then be tested. Even in development it is possible to conclude that the system of detection and classification of marine mammals is of great importance for the research done in the South Atlantic, since the known systems do not offer such functionalities for this area.