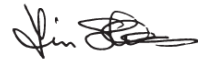


CERTIFICATE
EDITOR'S CHOICE ARTICLES

This certificate is given to

*Vanessa Lopez-Vazquez, Jose Manuel Lopez-Guede, Simone Marini,
Emanuela Fanelli, Espen Johnsen and Jacopo Aguzzi*

in recognition of the outstanding publication
"Video Image Enhancement and Machine Learning Pipeline for Underwater Animal Detection
and Classification at Cabled Observatories"
Sensors 2020, 20(3), 726, doi:10.3390/s20030726



Dr. Shu-Kun Lin
President & Publisher
MDPI

Paper analysing LoVe Ocean data awarded Editor's Choice

The recently published paper "Video Image Enhancement and Machine Learning Pipeline for Underwater Animal Detection and Classification at Cabled Observatories" has been awarded the Editor's Choice in MDPI Sensors. The Editor's Choice Articles are selected by the journal's Editor-in-Chiefs as noteworthy or likely to be of high interest to readers, and comprise key papers that highlight some of the best current research published in Sensors.

The objective of the paper is to introduce a pipeline for underwater animal detection and classification, which includes image processing and enhancing, contour segmentation and automated recognition and classification. The data used to train and validate the pipeline was taken by the fixed camera at Node 1 / Satellite 1 of the **LoVe Ocean Observatory** network.

For image pre-processing and enhancement, techniques like bilateral filter or contrast limited adaptative histogram equalization (CLAHE). Binary thresholding together with some morphological operations were applied in order to detect and extract contours of the underwater species. Global features like texture and colour features were extracted for later classification.

For the classification part, several algorithms were compared with each other to clarify which one obtained a more accurate classification result. Traditional classifiers such as support vector machine (SVM), k-nearest neighbors (K-NN), decision tree (DT) and random forest (RF) were used against modern techniques from deep learning, as convolutional neural networks (CNNs) and deep neural networks (DNNs). This pipeline

has demonstrated good results in the classification of animals of the Norwegian deep-sea. One of the deep neural networks reached the accuracy value of 76.18% and area under the curve value of 87.59%.

Congratulations to the authors! The full paper is open access paper and accessible through the journals webpage: <https://www.mdpi.com/1424-8220/20/3/726>