Proposal for a Local Database: Segmentation and Classification

Marc momar TALL[1], *Ibrahima NGOM*[1], *Ousmane SADIO*[1], *Ibrahima DIAGNE*[1]

[1]*Polytechnic Superior School.Cheikh Anta Diop University,Dakar,SENEGAL,49*

**marcmomar.tall@esp.sn*

1. Abstract

The management of fisheries in Senegal presents many difficulties, at the level of the fishing docks the fish caught are neither declared nor collected for stock recovery and fish classification. To achieve the objectives of detection, segmentation is one of the most important aspects. It is in this context that segmentation has been the subject of several research themes in recent years. In the field of fisheries in Senegal, data collection is very difficult due to the fact that the techniques used are very often manual. Consequently, a local database adapted to the objectives of the survey is lacking. In this paper, we have proposed a semantic segmentation algorithm that tends towards intelligent systems for collecting artisanal fisheries catches. Data are collected by taking images of caught fish and on Fishbase. The collected data applied to the algorithm allowed us to obtain a set of segmented data with the

2. INTRODUCTION

A semantic segmentation algorithm is used for the segmentation of fish images, most often the fish are taken in multicolored environments and by faith in the water which explains the need to segment the images and the output must be similar to the input image to obtain a prediction of the best performance. Caught species are neither reported nor collected on the dock for fish stock replenishment. Therefore to meet the challenge of intelligent fish management with artificial intelligence it is necessary to have segmented data. The data is collected by taking images of captured fish and to complete the base other resources are used like FISHBASE. Then, all the collected data form the library or database for training the model. The data is processed for further optimization. The use of these data allowed the training of the database, the training of the masks and to obtain well segmented images. This segmented dataset and the masks will serve as a guide for future research.

RESULTS AND DISCUSSION

The histogram of an image is a statistical curve that represents the distribution of pixels according to their density. For a black and white image, the abscissa represents the grey level (0 and 255) and the ordinate represents the number of pixels with this value. When the histogram is normalized, the ordinate represents the probability of finding a pixel with a grey level. P_i of finding a pixel of grey level i in the image.

$$\forall\, i \in \{0, \dots, 255\},\ P_i = \frac{number\ of\ pixels\ intensity\ i}{total\ number\ of\ pixels}$$

The pixel intensities are then treated as discrete random variables. The normalized histogram calculates the percentage of pixels with a value below a given grey level:

$$\forall\, i \in \{0, \dots, 255\},\ P_i = \sum_{k=n}^{i} P_k$$

3. Data Collection

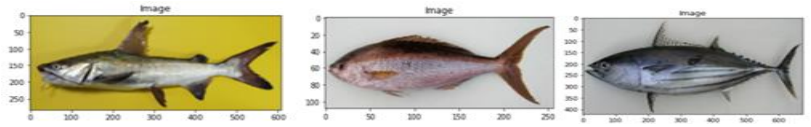
Collecting and processing the data, we divided the dataset into three groups: the training set, the test set and the validation set by the roboflow.

FAMILY	SPECIES	MINIMUM LENGTH	MAXIMUM LENGTH	PHOTO
...	...	...	...	...
Sparidés	*Pagrus caeruleostictus*	5.00	90.00	
Sparidés	*Pagrus pagrus*	7.00	91.00	
...	...	...	...	...
Mugilidés	*Parachelon grandisquamis*	6.00	40.00	

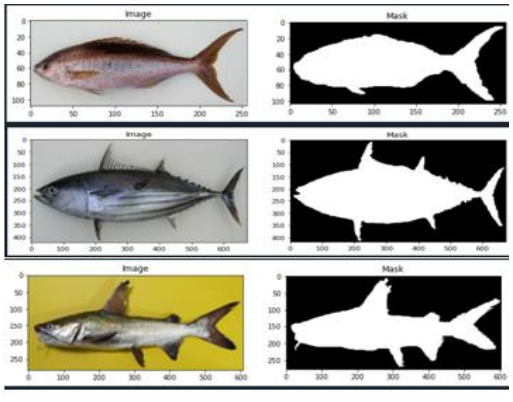
The characteristics of 825 fish species in the database. Each fish is characterized by family name, species name, size (max and min) in millimeters and a photo of the species. The whole database is redundant.

RESULTS AND DISCUSSION

- The images in the database are in tiff format, each image is characterized by its family name, species name, size (max, min), species length and photo.



- The program developed in python 3.7 in Jupiter generates masks next to each fish picture.



CONCLUSION

To provide solutions to the management of the fish stock caught at the Soumbédioune wharf. The use of machine learning combined with computer vision will be our main levis, given all the performances brought to the food industry sector thanks to AI. Automated systems in the artisanal fisheries sector will allow a transition from manual.