**Aim:** To build a YOLOv3 model for zooplankton detection and localisation on unseen images in Keras

**Datasets to be used:**

1. ZooScan

ZooScan is a dataset of 3771 images collected from the Bay of Villefranche-sur-mer using the ZooScan technology. The images belong to 20 categories with different number of samples for each category (from 28 to 427 samples per class). Most categories are zooplankton, other species of Medusae, and eggs of zooplankton; the remaining categories are non-zooplankton and images with bad focus.

<https://www.seanoe.org/data/00446/55741/>

1. Kaggle

Kaggle is a subset of the dataset collected in the Straits of Florida using ISIIS and used for the National Data Science Bowl of 2015 competition. The original dataset contains images from 121 categories. The distribution among classes is not uniform but varies from a minimum of 108 to a maximum of 1979 samples per class.

<https://www.kaggle.com/c/datasciencebowl>

1. WHOI-Plankton

WHOI-Plankton is a dataset of cells and other particles captured by Imaging FlowCytobot from Woods Hole Harbor water and can be accessed as supplemental material5 of [44]. The dataset contains 6600 manually categorized images stored in tiff format and split between training and testing sets of equal size. The images belongs to 22 categories with equal number of samples for each category (150 training samples and 150 test samples)

<https://github.com/hsosik/WHOI-Plankton>

**Related tutorials for method:**

(i) An introduction to implementing the YOLO algorithm for multi object detection in images

<https://towardsdatascience.com/an-introduction-to-implementing-the-yolo-algorithm-for-multi-object-detection-in-images-99cf240539>

(ii) How to Perform Object Detection with YOLOv3 in Keras

<https://machinelearningmastery.com/how-to-perform-object-detection-with-yolov3-in-keras/>

(iii) Deep Learning based Object Detection using YOLOv3 with OpenCV <https://www.learnopencv.com/deep-learning-based-object-detection-using-yolov3-with-opencv-python-c/>

1. Training YOLOv3 : Deep Learning based Custom Object Detector <https://www.learnopencv.com/training-yolov3-deep-learning-based-custom-object-detector/>