An Open-Source Application of Computer Vision and Machine Learning Algorithms to Quantify Microplastics

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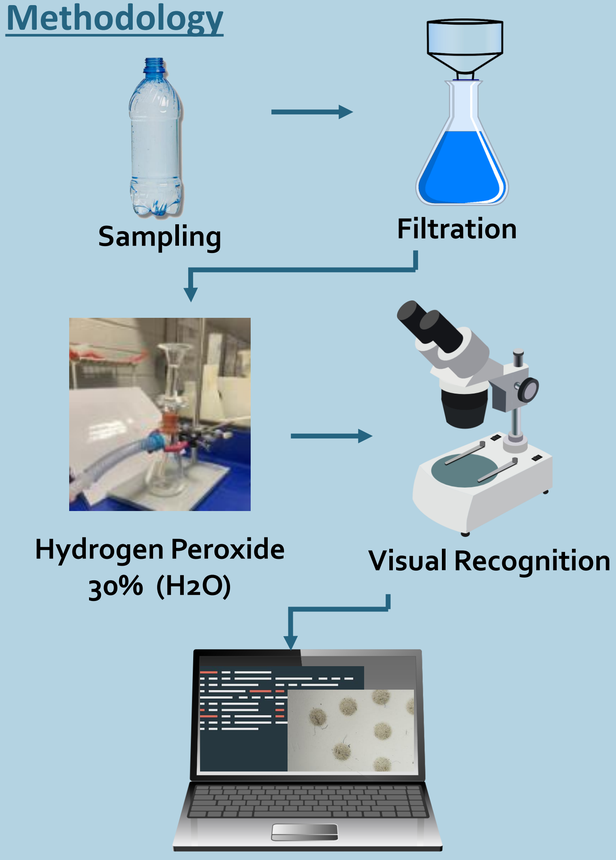
The Problem

Objectives

- To optimise a method that it is not time-consuming to quantify microplastics.
- To use open-source algorithms, YOLOv4 and Mask R-CNN to build an object detection model, able to detect microplastics from an image.
- To detect microplastics from environmental samples using the specific algorithms.

Methodology



Results

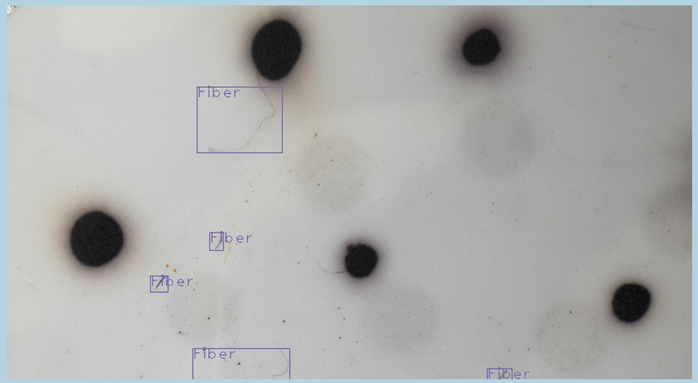


Figure 1. YOLO v.4

Figure 2. Mask R-CNN

Conclusions

1. Yolo v4 and mask R-CNN minimise the time to count microplastics.
2. Yolo v.4 has around 70% accuracy, while mask R-CNN has around 80%.
3. Microplastics can be detected with the minimum process before the quantification.

References

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He, K., Gkioxari, G., Dollár, P. and Girshick, R., 2017. Mask r-cnn. In Proceedings of the IEEE international conference on computer vision (pp. 2961-2969).