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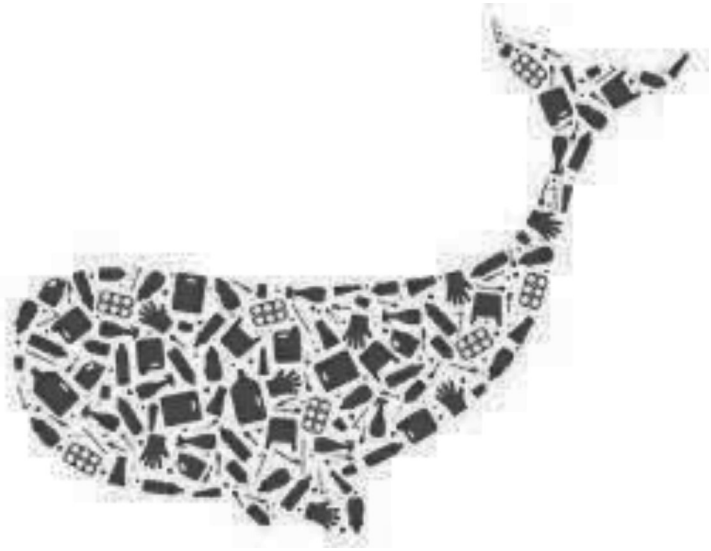
BOOK of ABSTRACTS



A NOVEL TECHNIQUE FOR AUTOMATED DETECTION, COUNT AND MEASUREMENT OF MICROPLASTICS

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Microplastics are *solid plastic particles* composed of different polymers whose dimensions are less or equal to 5 mm. They originate either from primary production or, more frequently, by degradation of plastic materials. Given their interaction with the ecosystems, and their long-lived persistence in the environment, they pose a significant threat to the world biota including human life. For that, their detection and continuous monitoring are of paramount importance. Unfortunately, detection and quantification of their abundance require a long work of visual observation and count, which makes the process of a high number of samples a very time-demanding task.
Softwares like ImageJ and MP-VAT has been employed with certain success to automate the detection and counting task, although the recognition is not always robust, and a fully automated process is still far. In this context, we report a novel approach in image analysis for detecting, counting, and measuring microplastics on filter membrane substrates with UV-excited fluorescence. The technique relies on a multichannel variant of the Canny edge detection algorithm, which allows an effective microplastic particle segmentation, even in the presence of a strong fluorescence halo.
The developed method has been validated against manual count on real sediment samples from Borgio Verezzi (Italy) show cave and water from Po River (Italy). After collection, the samples were treated with 30% hydrogen peroxide to remove fluorescent organic compounds and filtered on glass filter membranes. The filters were imaged with a high-resolution camera under 365 nm UV illumination to stimulate microplastic fluorescence emission.
In addition, the staining of microplastic with NileRed dye has also been tested to verify if it can provide improvements in terms of count reliability.