
Random Forest single channel classifier for FTIR Microplastic images

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Abstract

In this poster we intend to present our latest results on fast Microplastic (MP) detection. Random decision forests (RDFs) are used to build multiclass models for fast identification of Fourier-transform infrared (FT-IR) spectra of MP most common in environmental samples. The RDF operates with a reduced number of highly discriminative wavenumbers, their selection has been optimized through machine learning to select the most significant wavenumbers. Single wavenumber allows for input from direct IR, decreases inference time, and increases classification accuracy. The training and validation data are extracted from FT-IR data of purpose-made pure-type MP samples using reference spectra and the fast background correction and identification (FBCI) algorithm. RDF classification results are validated with procedurally generated MP samples as ground truths

Keywords: Fourier transform infrared spectroscopy, Machine learning, Random Forest, Microplastics, Variable selection

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