DeepRaman: a Deep learning diagnostic pipeline based on Raman spectroscopy

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Raman Spectroscopy (RS) promises the ability to encode in spectral data the significant differences between biological samples belonging to patients affected by a disease and samples of healthy patients (controls).

However, the decoding and interpretation of the Raman spectral fingerprint is still a difficult and time-consuming procedure even for domain experts. In this work we present a deep learning based computational pipeline able to classify spectral data from saliva samples.

The pipeline has been validated against the SARS-COV-2 Infection, and for the screening of neurodegenerative diseases such as Amyotrophic Lateral Sclerosis, Alzheimer's, and Parkinson's diseases.

The proposed system can represent a promising kernel for the development of non-invasive, cost and time-efficient early diagnostic tool.