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EvalSpek-ML

Compositional analysis identifies the elemental makeup of materials, with applications including tracing the geological origins of archaeological artifacts. Spectra, encompassing for example 16,384 distinct energy channels, provide a detailed elemental composition when analyzed by experts. This process is complex and time consuming, therefore EvalSpek-ML aims to use machine learning algorithms to streamline the analysis of those spectra. The project begins by setting a performance benchmark using 1CNNs, Random Forests, and FeedForward-NNs. It then advances to cutting-edge NNs, such as Encoder-Decoder Networks, to enhance the efficacy of foundational ML algorithms. The dataset used to train the algorithms includes expert-evaluated spectra along with artificially generated data. Further, this approach will be generalized to map other types of spectra.

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Keywords

Machine Learning
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