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PHierarchical Multi-Instance Learning: Theory, Some Applications, and Benefits

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Engineers love to store data in structured file formats like JSON, XML, Protobuf, MessagePack, etc. I believe that this love is caused by humans nature, as it is easy for us to describe a big complicated object by dividing it into pieces and describe those. These structured data are in sharp contradiction to tensors of fixed dimension favored by machine learning scientists and practitioners. Hierarchical multi-instance learning provides a convenient bridge allowing to adapt supervised classification with neural networks to ingest (and classify) structured data. This leads to an almost straightforward creation of classifiers with state-of-the-art performance. Moreover, explanations of decisions based on structured data can be presented in a form easily understandable by humans, which is an important benefit for practical applications.