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Quark versus gluon tagging in CMS Open Data with CWoLa and TopicFlow

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Tools for discriminating quark and gluon jets are of key importance at the LHC. Methods that train directly on real data are well motivated due to both the ambiguity of parton labels and the potential for mismodelled jet substructure in Monte Carlo. This talk presents a study of weakly-supervised learning applied to Z+jet and dijet events in CMS Open Data. Using CWoLa classifiers, we investigate the quark/gluon content of the datasets under the jet topics framework. We also implement TopicFlow: a deep generative model that disentangles quark and gluon distributions from mixed datasets. We discuss the use of TopicFlow both as a generative classifier and as a way to evaluate quark/gluon tagging performance.

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