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Recursive Neural Networks in Quark/Gluon Tagging

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Vidyo contribution

Based on the natural tree-like structure of jet sequential clustering, the recursive neural networks (RecNNs) embed jet clustering history recursively as in natural language processing. We explore the performance of RecNN in quark/gluon discrimination. The results show that RecNNs work better than the baseline BDT by a few percent in gluon rejection at the working point of 50% quark acceptance. We also experimented on some relevant aspects which might influence the performance of networks. It shows that even only particle flow identification as input feature without any extra information on momentum or angular position is already giving a fairly good result, which indicates that most of the information for q/g discrimination is already included in the tree-structure itself.

Intended contribution length

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