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Study for jet flavor tagging with recent Neural Network

Jets are the most familiar and complex physical objects in high-energy physics experiments.

Since jets invariably appear in critical elementary particle processes, identifying their origin has become an essential technique for physical analysis, including new particle searches and precision measurements.

Many particles are produced in jets, detected by particle detectors, and reconstructed as flight trajectories or calorimetric clusters.

In recent years, machine learning, mainly neural networks, has been studied and used for the flavor classification of jets.

Graph neural networks, in particular, have been well studied and have produced excellent results, as they are well suited to representing the particles in jets.

Transformer, which has been successful in the development of large-scale language models in recent years, can also be used for flavor classification of jets due to its versatile architecture.

Thus, we adopt the latest techniques of the Transformer family instead of the traditional graph neural networks.

Thus, it is possible to apply the shortcomings of graph neural networks and the latest research results of the Transformer family.

This presentation will present research results on jet flavor classification using Transformer as architecture.

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