



Contribution ID: 15

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Classification of decays involving variable decay chains with convolutional architectures

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Vidyo contribution

We present a technique to perform classification of decays that exhibit decay chains involving a variable number of particles, which include a broad class of B meson decays sensitive to new physics. The utility of such decays as a probe of the Standard Model is dependent upon accurate determination of the decay rate, which is challenged by the combinatorial background arising in high-multiplicity decay modes. In our model, each particle in the decay event is represented as a fixed-dimensional vector of feature attributes, forming an $n \times k$ representation of the event, where n is the number of particles in the event and k is the dimensionality of the feature vector. A convolutional architecture is used to capture dependencies between the embedded particle representations and perform the final classification. The proposed model performs outperforms standard machine learning approaches based on Monte Carlo studies across a range of variable final-state decays with the Belle II detector.

Intended contribution length

20 minutes

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