Contribution ID: **41**   Type: **not specified**

Deep-Learned Event Variables

Thursday 8 July 2021 17:40 (20 minutes)

The choice of optimal event variables is crucial for achieving the maximal sensitivity of experimental analyses, and suitable kinematic variables for many well-motivated event topologies have been developed in collider physics. Here we propose a deep-learning-based algorithm to design good event variables that are sensitive to a wide range of the unknown model parameter values. We demonstrate that the neural networks trained with our algorithm on some simple event topologies are able to reproduce standard variables like invariant mass, transverse mass, and stransverse mass. These simple exercises can address two issues: 1) what have machines learned (explainability)? and 2) are human-engineered features best (optimality)? The method is automatable, completely general, and can be used to derive sensitive, previously unknown, event variables for other, more complex event topologies.

Affiliation

Texas A&M University

Academic Rank

Postdoctoral researcher

Author: KIM, Doojin (Texas A & M University (US))

Presenter: KIM, Doojin (Texas A & M University (US))

Session Classification: Interpretability, Robustness, and Uncertainties