Contribution ID: **13** Type: **not specified**

Unweighting multijet event generation using factorisation-aware neural networks

Wednesday 26 April 2023 10:00 (20 minutes)

The generation of unit-weight events for complex scattering processes presents a severe challenge to modern Monte Carlo event generators. Even when using sophisticated phase-space sampling techniques adapted to the underlying transition matrix elements, the efficiency for generating unit-weight events from weighted samples can become a limiting factor in practical applications. Here we present the combination of a two-staged unweighting procedure with a factorisation-aware matrix element emulator using neural networks which we make accessible in the Sherpa event generation framework. The algorithm can significantly accelerate the unweighting process, while it still guarantees unbiased sampling from the correct target distribution. We apply, validate and benchmark the approach for partonic channels contributing at the tree-level to the high-multiplicity LHC production processes $Z + 4, 5$ jets and $t\bar{t} + 3, 4$ jets, where we find speed-up factors between 16 and 350.

Presenter: JANSSEN, Timo

Session Classification: Student and Postdoc talks