Jet tagging with deep sets of subjets

Friday 4 November 2022 11:10 (20 minutes)

We introduce a complete basis of subjets for machine learning-based jet tagging. The subjets are obtained with (i) a fixed radius or (ii) the clustering is performed until a fixed number of subjets is obtained. For nonzero values of the subjet radius, the resulting classifier is Infrared-Collinear (IRC) safe. By lowering the subjet radius, we can increase the sensitivity to nonperturbative physics. In the limit of a vanishing subjet radius, the exclusive subjet basis approximates deep sets/particle flow networks (IRC unsafe). The basis introduced here is thus ideally suited to quantify the information content of jets at the boundary of perturbative vs. nonperturbative physics.

Primary authors: ATHANASAKOS, Dimitrios; RINGER, Felix (Stony Brook University); MULLIGAN, James (University of California, Berkeley (US)); LARKOSKI, Andrew (SLAC National Accelerator Laboratory); PLOSKON, Mateusz (Lawrence Berkeley National Lab. (US))

Presenter: ATHANASAKOS, Dimitrios

Session Classification: Interpretability