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Studying Hadronization by Machine Learning Techniques

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Hadronization is a non-perturbative process, which theoretical description can not be deduced from first principles. Modeling hadron formation, requires several assumptions and various phenomenological approaches. Utilizing state-of-the-art Computer Vision and Deep Learning algorithms, it is eventually possible to train neural networks to learn non-linear and non-perturbative features of the physical processes.

Here, I would like to present the results of two deep neural networks, by investigating global and kinematical quantities, indeed jet- and event-shape variables. The widely used Lund string fragmentation model is applied as a baseline in $\sqrt{s}$=7 TeV proton-proton collisions to predict the most relevant observables at further LHC energies. Non-liear QCD scaling properties were also identified and validated by experimental data.

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