

Gradient Boosting MUST taggers for highly-boosted jets

Identification of multi-pronged jets plays a fundamental role at the LHC and other colliders, especially in the forthcoming years when the energy frontier will reach unexplored regions. Within multivariate tools, the strategy of MUST (Mass Unspecific Supervised Tagging) has proven to be successful for implementing generic jet taggers capable of discriminating signals over a wide range of jet masses. We extend the MUST concept, by using eXtreme Gradient Boosting (XGBoost) classifiers instead of neural networks (NN's). We build both fully-generic and specific multi-pronged taggers, to identify 2, 3 and/or 4-pronged signals from SM QCD background. We show that XGBoost-based taggers are not only easier to optimize and faster to train than those based in NN's, but also can improve the performance in some cases, even when testing with signals not used in training.

Authors: JOAQUIM, Filipe; SEABRA FONSECA, João; Prof. AGUILAR-SAAVEDRA, Juan Antonio; Dr SANDÁ SEOANE, Rosa María

Presenter: Dr SANDÁ SEOANE, Rosa María

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