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Back to the Roots: Tree-Based Algorithms for Weakly Supervised Anomaly Detection

Wednesday, November 8, 2023 4:00 PM (15 minutes)

Weakly supervised methods have emerged as a powerful tool for model agnostic anomaly detection at the LHC. While these methods have shown remarkable performance on specific signatures such as di-jet resonances, their application in a more model-agnostic manner requires dealing with a larger number of potentially noisy input features. We show that neural networks struggle with noisy input features and that this issue can be solved by using boosted decision trees. Overall, boosted decision trees have a superior and more predictable performance in the weakly supervised setting than neural networks. Additionally, we significantly improve the performance by using an extended set of features.

Primary authors: MUECK, Alexander; SHIH, David; KASIECZKA, Gregor (Hamburg University (DE)); SOMMERHALDER, Manuel (Hamburg University (DE)); HEIN, Marie (RWTH Aachen University); KRAMER, Michael (Rheinisch Westfaelische Tech. Hoch. (DE)); PRANGCHAIKUL, Parada (Universität Hamburg (DE)); FINKE, Thorben; QUADFASEL, Tobias

Presenter: HEIN, Marie (RWTH Aachen University)

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