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Auto-Encoder based algorithms for anomaly detection

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Among all of the applications of Machine Learning in HEP, anomaly detection methods have been receiving a growing interest over the last years. Their use is especially promising in the development of model independent search techniques. Following this trend line, we propose new algorithms based on the artificial neural network concept of the Auto-Encoder, augmented with adversarial training schemes, flow-based approaches, and variable decorrelation techniques. The performance of our methods is going to be evaluated on the data designed for the LHC Olympics 2020 challenge [1]. We will present results for both the RnD dataset and the Black Box datasets proposed for this anomaly detection competition.

[1] https://lhco2020.github.io/homepage/

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