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Exercise 2: Classification and anomaly detection in S-top searches

Thursday 12 March 2026 16:00 (2 hours)

Classification is a category of supervised learning where the goal is to classify the data into different categories. For the CMS search of the supersymmetric partner of the top quark in the compressed mass scenario a Boosted Decision Tree (BDT) algorithm was used to distinguish between signal-like and background-like events. In this exercise, a neural network will be implemented to achieve this task and performance will be compared with the BDT approach. If time allows, a further attempt will be made with an autoencoder neural network, where only background simulated events are used for training, the performance of this approach will also be compared to the previous two approaches. For comparison of the approaches a simplified limit setting via the pyhf library will be used.

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