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Unsupervised Machine Learning for New Physics Searches

Friday, December 3, 2021 4:50 PM (30 minutes)

In the absence of new physics signals and in the presence of a plethora of new physics scenarios that could hide in the copiously produced LHC collision events, unbiased event reconstruction and classification methods have become a major research focus of the high-energy physics community. Unsupervised machine learning methods, often used as anomaly-detection methods, are trained on Standard Model processes and should indicate if a collision event is irreconcilable with the kinematic features of Standard Model events. I will briefly review popular unsupervised neural network methods proposed for the analysis of high-energy physics collision events. Further, I will discuss how physics principles can guide such methods and how their susceptibility to systematic uncertainties can be curbed.

Speaker time zone

References

Significance

Presenter: SPANNOWSKY, Michael (University of Durham (GB))

Session Classification: Plenary