Contribution ID: **158**   Type: **20 minutes talk**

Improved Constraints on Effective Top Quark Interactions using Edge Convolution Networks

Friday, 17 December 2021 14:30 (30 minutes)

Reinterpreting the LHC results as bounds on the Wilson Coefficients (WCs) of the Standard Model Effective Field Theory (SMEFT) allows studying new-physics effects in a model-independent way. However the large number of effective interactions along with theoretical and experimental uncertainties often result in poor constraints on WCs that motivate the use of alternative techniques with more comprehensive extraction of information from data. In this presentation I will talk about constructing physics-inspired graphs from the final states of $pp \to t\bar{t}$ production with semi-leptonic top decays, and using Edge Convolution Neural Networks in order to condense the multidimensional phase space information. When a signal region is identified from the output of the neural network such that the SM contribution is minimised, the approach yields improvements on the bounds of WCs, compared to analyses on inclusive collision data employing differential distributions to measure deviations from the SM.

Could you please give the most relevant category for your talk?

Machine Learning

Will you be pre-recording your talk?

No

Are you happy for your talk to be recorded?

Yes

Would you be interested in receiving feedback on your presentation?

Yes

Primary authors: ATKINSON, Oliver (University of Glasgow); BHARDWAJ, Akanksha (University of Glasgow); BROWN, Stephen (University of Glasgow); ENGLERT, Christoph (University of Glasgow); MILLER, David J. (University of Glasgow); STYLIANOU, Panagiotis (University of Glasgow)

Presenter: STYLIANOU, Panagiotis (University of Glasgow)

Session Classification: Full-length talks