Contribution ID: **17** Type: **not specified**

How to train taggers on data

Tuesday 18 September 2018 11:30 (15 minutes)

Dr. Jennifer Thompson, CERN

Abstract: The machine learning methods currently used in high energy particle physics often rely on Monte Carlo simulations of signal and background. A problem with this approach is that it is not always possible to distinguish whether the machine is learning physics or simply an artefact of the simulation. In this presentation I will explain how it is possible to perform a new physics search with a tagger that has been trained entirely on background data. I will show how jets of particles produced at the LHC, are prime targets for such an approach. To this end, we use an unsupervised learning method, trained entirely on background jets, to detect any anomalous result as a new physics signal. I will show a range of applications for this approach, and describe how to practically include it in an experimental analysis by mass-decorrelating the network output in an adversarial framework and performing a bump hunt.

Bio: I am a theorist in particle physics based at Heidelberg university for the second stage of my first postdoc. I graduated from the University of Durham with work on Monte Carlo simulations of events at high energy colliders, on NLO corrections in QCD, and on approximations to NLO EW corrections. From this, I moved into interfacing full NLO EW corrections before transitioning to using Machine Learning algorithms for phenomenological studies in a high energy particle physics setting.

Presenter: Dr THOMPSON, Jennifer

Session Classification: Day 2