Contribution ID: **31** Type: **Poster**

Training Deep 3D Convolutional Neural Networks to Extract BSM Physics Parameters Directly from HEP Data: a Proof-of-Concept Study Using Monte Carlo Simulations

Thursday 18 July 2024 20:40 (20 minutes)

We report on a novel application of computer vision techniques to extract beyond the Standard Model (BSM) parameters directly from high energy physics (HEP) flavor data. We develop a method of transforming angular and kinematic distributions into "quasi-images" that can be used to train a convolutional neural network to perform regression tasks, similar to fitting. This contrasts with the usual classification functions performed using ML/AI in HEP. As a proof-of-concept, we train a 34-layer Residual Neural Network to regress on these images and determine the Wilson Coefficient C_9 in MC (Monte Carlo) simulations of $B \to K^* \mu^+ \mu^-$ decays. The technique described here can be generalized and may find applicability across various HEP experiments and elsewhere.

Alternate track

1. Quark and Lepton Flavour Physics

I read the instructions above

Yes

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Session Classification: Poster Session 1

Track Classification: 14. Computing, AI and Data Handling