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Track parameter regression with Transformers

As the High-Luminosity LHC (HL-LHC) era approaches, significant improvements in reconstruction software are required to keep pace with the increased data rates and detector complexity. A persistent challenge for high-throughput GPU-based event reconstruction is the estimation of track parameters, which is traditionally performed using iterative Kalman Filter-based algorithms. While GPU-based track finding is progressing rapidly, the fitting stage remains a bottleneck. The main slowdown is coming from data movement between CPU and GPU which reduce the benefits of acceleration.

This work investigates a deep learning-based alternative using Transformer architectures for the prediction of the track parameters. The approach shows promising results on the TrackML dataset.

Would you like to be considered for an oral presentation?

Yes

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