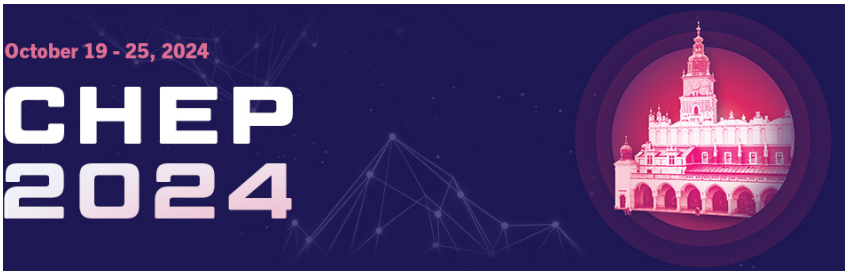

Contribution ID: **273** Type: **Talk**

EggNet: An Evolving Graph-based Graph Attention Network for End-to-end Particle Track Recontruction

Thursday 24 October 2024 17:27 (18 minutes)

Track reconstruction is a crucial task in particle experiments and is traditionally very computationally expensive due to its combinatorial nature. Recently, graph neural networks (GNNs) have emerged as a promising approach that can improve scalability. Most of these GNN-based methods, including the edge classification (EC) and the object condensation (OC) approach, require an input graph that needs to be constructed beforehand. In this work, we consider a one-shot OC approach that reconstructs particle tracks directly from a set of hits (point cloud) by recursively applying graph attention networks with an evolving graph structure. This approach iteratively updates the graphs and can better facilitate the message passing across each graph. Preliminary studies on the TrackML dataset show physics and computing performance comparable to current production algorithms for track reconstruction. We also explore different techniques to reduce constraints on computation memory and computing time.

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