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Towards a Track Condensation Network

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Tracker data is naturally represented as a graph by embedding tracker hits as nodes and hypothesized particle trajectories as edges. Edge-classifying graph neural networks (GNNs) have demonstrated powerful performance in rejecting unphysical edges from such graphs, yielding a set of disjoint subgraphs that ideally correspond to individual tracks. Post-processing modules, for example clustering algorithms like DBSCAN, are typically applied to the edge-weighted graphs to find tracks. In this work, we consider a learned approach track clustering in a GNN pipeline. Our results are based on object condensation, a multi-objective learning framework designed to perform clustering and property prediction in one shot. Key results will be shown at each stage of this pipeline, including graph construction, edge classification, track hit clustering, noise rejection, and track property prediction.

Consider for young scientist forum (Student or postdoc speaker)

Yes

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