

Towards a realistic track reconstruction algorithm based on graph neural networks for the HL-LHC

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The physics reach of the HL-LHC will be limited by how efficiently the experiments can use the available computing resources, i.e. affordable software and computing are essential. The development of novel methods for charged particle reconstruction at the HL-LHC incorporating machine learning techniques or based entirely on machine learning is a vibrant area of research. In the past two years, algorithms for track pattern recognition based on graph neural networks (GNNs) have emerged as a particularly promising approach. Previous work mainly aimed at establishing proof of principle. We present new algorithms, implemented in the ACTS framework, that can handle complex realistic detectors. This work aims at implementing a realistic GNN-based algorithm that can be deployed in an HL-LHC experiment.

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