Contribution ID: **85**   Type: **not specified**

Vertex Reconstruction with Transformers

Monday 6 November 2023 11:30 (15 minutes)

The identification of heavy-flavour jets (tagging) remains a critical task at hadron colliders. A key signature of such jets is the displaced decay vertices left by boosted b- and c-hadrons. While existing tagging algorithms leveraged manually designed algorithms to identify and fit vertices, they were succeeded by edge-classification based Graph Neural Networks (GNNs) that, despite identifying vertices, fell short of reconstructing their properties. We propose the use of a transformer architecture for vertex reconstruction inside jets. Using reconstructed tracks, our approach is able to simultaneously identify the decay of heavy-flavour hadrons, assign tracks to the respective decay vertices, and determine each vertex's properties, overcoming a key limitation of previous ML-based approaches to vertex reconstruction.

Authors: FACINI, Gabriel (University of London (GB)); BARR, Jackson (UCL); HART, Max (University of London (GB)); POND, Nikita Ivvan (University of London (GB)); VAN STROUD, Samuel (UCL); RETTIE, Sebastien (CERN); Dr SCANLON, Timothy Paul (UCL)

Presenter: POND, Nikita Ivvan (University of London (GB))

Session Classification: Tagging Techniques