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Mikado approach for the TrackML Particle Tracking Challenge

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The Mikado approach is the winner algorithm of the final phase of the TrackML particle reconstruction challenge [1].

The algorithm is combinatorial. Its strategy is to reconstruct data in small portions, each time trying to not damage the rest of the data. The idea reminds Mikado game, where players should carefully remove wood sticks one-by-one from a heap.

The algorithm does 60 reconstruction passes, each time reconstructing only small portion of tracks. A high speed is achieved thanks to a fast data access within fixed-size search windows.

As the search windows are individual for each reconstruction pass, the algorithm has tens of thousands of parameters to tune. The parameters were trained on the ground truth data, making the Mikado approach similar to Machine Learning approaches.

The algorithm shows 94.4% accuracy and takes 0.56 seconds per event.

[1] Sabrina Amrouche et al., The Tracking Machine Learning challenge: Accuracy phase, NIPS 2018 proceedings.

Consider for promotion

No

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Session Classification: Track 2 –Offline Computing

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