Topic 1: Continuous benchmark

- Now detray and traccc CI runs benchmark for every merged PR (Thanks to Paul)
    - The plots can be found in the README

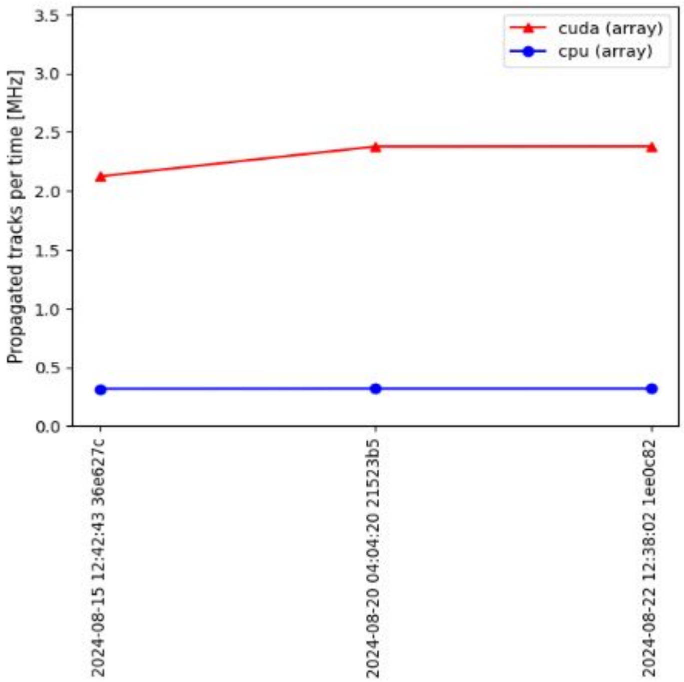
- This is not a very serious benchmark and the setup is a bit sloppy. The main purpose is catching any PR that affects the performance critically

[acts / detray-benchmark · GitLab (cern.ch)]

[acts / traccc-benchmark · GitLab (cern.ch)]

Continuous benchmark

Monitoring the propagation speed with the toy geometry



Topic 2: Thoughts on Measurement creation

- Current clusterization is a naive CCA
- Current measurement creation is based on the assumption that the PDF for the spatial distribution of track is uniform. (i.e. Std. Dev. = L/sqrt(12))
- Instead, ATHENA uses the neural network for proper cluster splitting and measurement parameter estimation
- We may not have to follow the same algorithm but, at least, we need to validate the reconstructed measurements are OK
    - In my opinion, the cluster splitting may be done later

A neural network clustering algorithm for the ATLAS silicon pixel detector

The ATLAS collaboration

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ABSTRACT: A novel technique to identify and split clusters created by multiple charged particles in the ATLAS pixel detector using a set of artificial neural networks is presented. Such merged clusters are a common feature of tracks originating from highly energetic objects, such as jets. Neural networks are trained using Monte Carlo samples produced with a detailed detector simulation. This technique replaces the former clustering approach based on a connected component analysis and charge interpolation. The performance of the neural network splitting technique is quantified using data from proton-proton collisions at the LHC collected by the ATLAS detector in 2011 and from Monte Carlo simulations. This technique reduces the number of clusters shared between tracks in highly energetic jets by up to a factor of three. It also provides more precise position and error estimates of the clusters in both the transverse and longitudinal impact parameter resolution.

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