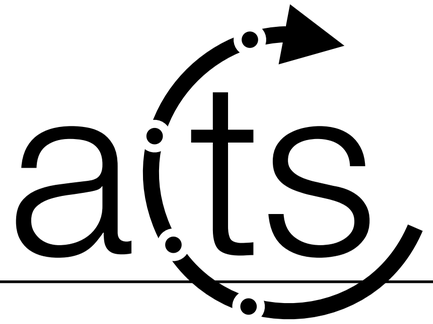

ML Parameter optimisation

A. Salzburger (CERN)

ML assisted reconstruction

Apart from end-to-end solution, should investigate where we can use ML assisted reconstruction

- Classifications, e.g. good/bad classification, merged cluster identification
- Fitting inference (not really tried much yet)
- Optimisation of the existing reconstruction
  - Can be done with optimisation regression runs (convex optimisation methods)
  - Can we learn the best parameters for certain modules ?

Example: Mikado

Winning solution from Sergey Gorbunov

- Classical track (iterative) track reconstruction setup, with O(1000s) tuning parameters.

> To achieve the best result, one has to tune all thousands of algorithm parameters simultaneously, maximizing the overall score Eq. 1. But due to a lack of computing resources, a step-by-step optimization is performed instead. Each reconstruction pass is adjusted individually, optimizing the result of the partial reconstruction after that pass

Preview of the TrackML Throughput paper to be submitted soon to CSBS

Technicalities: training inside ACTS

Ideally would be workflow with declaring tuneable parameters

- Can we put that into the code?