

Numerical Optimization for Fast Track Finding Based on the Artificial Retina Algorithm

Thursday, 13 October 2016 15:15 (15 minutes)

High-energy physics experiments rely on reconstruction of the trajectories of particles produced at the interaction point. This is a challenging task, especially in the high track multiplicity environment generated by p-p collisions at the LHC energies. A typical event includes hundreds of signal examples (interesting decays) and a significant amount of noise (uninteresting examples).

This work describes a modification of Artificial Retina Algorithm for fast track finding: numerical optimization methods were adopted for fast local track search. This approach allows for considerably reduction of the total computational time per event. Test results on simplified simulated model of LHCb VELO (Vertex Locator) detector are presented. Also this approach is well-suited for implementation for paralleled computations as GPU which looks very attractive in the context of upcoming detector upgrade.

Primary Keyword (Mandatory)

Artificial intelligence/Machine learning

Secondary Keyword (Optional)

Reconstruction

Tertiary Keyword (Optional)

Algorithms

Primary author: BORISYAK, Maxim (National Research University Higher School of Economics (HSE) (RU); Yandex School of Data Analysis (RU))

Co-authors: USTYUZHANIN, Andrey (National Research University Higher School of Economics (HSE) (RU); Yandex School of Data Analysis (RU)); DERKACH, Denis (National Research University Higher School of Economics (HSE) (RU); Yandex School of Data Analysis (RU)); BELOUS, Mikhail (Yandex School of Data Analysis (RU))

Presenter: BORISYAK, Maxim (National Research University Higher School of Economics (HSE) (RU); Yandex School of Data Analysis (RU))

Session Classification: Track 1: Online Computing

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