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Multi-GPU training and parallel CPU computing for the machine learning experiments using Ariadne library

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Modern machine learning (ML) tasks and neural network (NN) architectures require huge amounts of GPU computational facilities and demand high CPU parallelization for data preprocessing. At the same time, the Ariadne library, which aims to solve complex high-energy physics tracking tasks with the help of deep neural networks, lacks multi-GPU training and efficient parallel data preprocessing on the CPU.

In our work, we present our approach for the Multi-GPU training in the Ariadne library. We will present efficient data-caching, parallel CPU data preprocessing, generic ML experiment setup for prototyping, training, and inference deep neural network models. Results in terms of speed-up and performance for the existing neural network approaches are presented with the help of GOVORUN computing resources.

Summary

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