Contribution ID: **189** Type: **Poster**

Scaling the SciDAC QuantOM Workflow

Thursday 14 March 2024 16:10 (30 minutes)

As part of the Scientific Discovery through Advanced Computing (SciDAC) program, the Quantum Chromodynamics Nuclear Tomography (QuantOM) project aims to analyze data from Deep Inelastic Scattering (DIS) experiments conducted at Jefferson Lab and the upcoming Electron Ion Collider. The DIS data analysis is performed on an event-level by combining the input from theoretical and experimental nuclear physics into a single, composable workflow. The optimization itself (I.e. fitting the experimental data with theoretical predictions) is carried out by a machine / deep learning algorithm. The size of the acquired DIS data as well as the complexity of the workflow itself require that the analysis is performed across multiple GPUs on high performance computing systems, such as Polaris at Argonne National Laboratory.

This presentation discusses the novelties and challenges that came along with parallelizing this workflow. Recent results are compared to common distributed training techniques.

Significance

This presentation shows novel techniques that were developed to train a GAN based workflow across multiple GPUs

References

Experiment context, if any

Deep Inelastic Experiments conducted at Jefferson Lab and the furure EIC.

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Session Classification: Poster session with coffee break

Track Classification: Track 1: Computing Technology for Physics Research