Contribution ID: **270** Type: **Talk**

Computing for the DUNE Long Baseline Neutrino Oscillation Experiment

Wednesday, 29 July 2020 17:50 (20 minutes)

The DUNE long-baseline neutrino oscillation collaboration consists of over 180 institutions from 33 countries. The experiment is in preparation now with the commissioning of the first 10kT fiducial volume Liquid Argon TPC expected over the period 2025-2028 and a long data-taking run with 4 modules expected from 2029 and beyond.

An active prototyping program is already in place with a short test beam run with a 700T, 15,360 channel prototype of single-phase readout at the neutrino platform at CERN in late 2018 and tests of a similar sized dual-phase detector scheduled for mid-2019. The 2018 test beam run was a valuable live test of our computing model. The detector produced raw data at rates of up to ˜2GB/s. These data were stored at full rate on tape at CERN and Fermilab and replicated at sites in the UK and the Czech Republic. In total, 1.8 PB of raw data were produced and reconstructed during the six-week test beam run.

DUNE already benefits from existing Grid infrastructure developed for the LHC. Multiple US and European sites are part of this resource pool and have made significant contributions to the ProtoDUNE single and dual-phase programs. We expect this global computing model to grow and evolve as we move towards data from the full DUNE detectors in the middle of the next decade.

Baseline predictions for the full DUNE detector data, starting in the mid-2020s are 30-60 PB of raw data per year. In contrast to traditional HEP computational problems, DUNE's Liquid Argon TPC data consist of simple but very large (many GB) 2D data objects which share many characteristics with astrophysical images. This presents opportunities to use advances in machine learning and pattern recognition as a frontier user of High-Performance Computing facilities capable of massively parallel processing.

I read the instructions

Secondary track (number)

12

Primary author: KIRBY, Michael (Fermi National Accelerator Laboratory)

Presenter: KIRBY, Michael (Fermi National Accelerator Laboratory)

Session Classification: Computing and Data Handling

Track Classification: 14. Computing and Data Handling