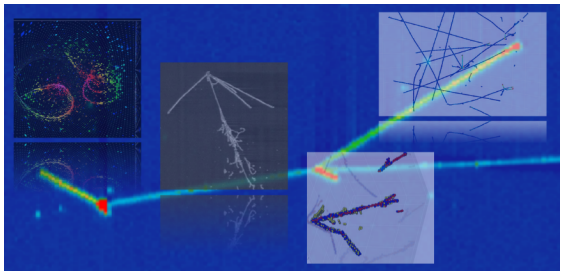

Contribution ID: **21** Type: **Collaboration Talk**

Nova collaboration talk

Wednesday, 23 August 2023 10:00 (35 minutes)

NOvA is a leading long-baseline neutrino experiment. Using neutrinos from the ~900 kW NuMI beam at Fermi National Accelerator Laboratory, with a near detector on site and an 810 km baseline to the far detector, in Ash River, Minnesota, NOvA can probe neutrino oscillations. Both detectors are functionally similar fine-grained segmented calorimeters, which makes the readout well-suited as an input for computer vision algorithms. NOvA has employed machine learning in several analyses, including our most recent 3-flavor oscillation results. These algorithms identify topological features and use them to predict neutrino interaction flavor and particle identification. For our most recent 3-flavor oscillation analysis, we used a new optimized architecture and improved training that both enhanced performance for physics analyses and made the network more robust against systematic uncertainties. We also introduced a new network designed to filter out cosmic interactions as early as possible in our reconstruction chain. Work is underway to develop our next generation of interaction flavor and particle identification algorithms, in addition to new machine learning networks for reconstruction tasks, such as vertex finding, that have used traditional techniques until now.

Presenter: BACK, Ashley (Indiana University)

Session Classification: Session 3