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Improvements and New Applications of Machine Learning Tools for NOvA

NOvA, a long baseline neutrino oscillation experiment, has made new measurements of the oscillations of neutrinos and anti-neutrinos. Key to these measurements is the use of machine learning algorithms that use topological features to reconstruct neutrino interaction flavor and particle identity. NOvA's latest analysis has made several key improvements to these algorithms which are much faster than previous iterations and show improvements in the physics capabilities of the techniques. This includes a new, optimized architecture and improved training techniques which enhance our performance for physics analyses and reduce systematic bias. NOvA has also begun developing techniques for the next generation of analyses using full event reconstruction to create an end-to-end algorithm. This poster will demonstrate the improvements in NOvA's machine learning program for reconstructing neutrino events and how NOvA has optimized and evaluated these algorithms for use in neutrino oscillation analyses.

Mini-abstract

NOvA's improved machine learning tools enhance physics capabilities and reduce systematic bias.

Experiment/Collaboration

NOvA Collaboration

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