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Neutrino Identification using Convolutional Neural Networks in the NOvA Experiment RYAN MURPHY, Indiana Univ - Bloomington, NOVA COLLABORATION COLLABORATION — Convolution Neural Networks (CNNs) have been successful in many complex computer vision problems in image identification and analysis due to recent advents in efficient GPU training. Due to these successes, effort was put forth to bring this technology to applications in HEP where the data could be easily converted into images. NOvA is a long baseline neutrino oscillation experiment designed to visually identify and reconstruct neutrino interactions in our detectors. Using a CNN, we created a algorithm for the identification of neutrino interaction types and neutrino flavors using the Caffe framework. In 2016, NOvA released the first HEP result to employ a CNN in the ν_μ to ν_e oscillation channel. In this talk I will describe our implementation of CNN in the Caffe framework, its application to NOvA events, and improvements made to our original implementation.

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