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Looking at BNB Neutrinos in the NOvA Near Detector

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The NOvA Near Detector (ND) is a 300-ton, fine-grained, nearly fully active low-Z tracking calorimeter located at Fermilab, located 1 km from the NuMI beam target. The unique positioning of the ND also results in an exposure to Booster Neutrino Beam (BNB) neutrinos at 162 mrad off-axis, 780 m away from the target with a kaon-induced neutrino energy peak around 1.4 GeV and a pion-induced energy peak around 400 MeV. With an estimated 2500 $\nu\mu$ true charged-current interactions from the BNB per year, there are enough data to perform a pion/kaon production ratio measurement, with an opportunity to augment the NOvA ND energy scale and add to the understanding of neutrino cross-sections in the 1-2 GeV region in the future. This analysis implements new algorithms to identify and reconstruct low energy events by using visual deep learning tools such as convolutional neural networks. This poster discusses the current status of the analysis.

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