Electron Neutrino Energy Reconstruction with Convolutional Neural Network SHIQI YU, Illinois Inst of Tech /Argonne Nat. Laboratory, NOVA COLLABORATION — NOvA is a long baseline neutrino oscillation experiment. It uses two functionally identical liquid scintillator detectors to measure ν_e appearance and ν_μ disappearance at the Far Detector in the ν_μ beam produced by the NuMI facility at Fermilab.

NOvA uses a convolutional neural network(CVN) to identify neutrino events. A different network, called "Prong-CVN", has been used to classify reconstructed particles in each event as either lepton or hadron. Within each event, hits are clustered into prongs to reconstruct final state particles and these prongs form the input to this new classifier. Classified particle energies are then used as input to an electron neutrino energy estimator. Improving the resolution and systematic robustness of NOvA's energy estimator will improve the sensitivity of the oscillation measurements. In this talk, I will present our methods to identify particles with Prong-CVN and the following approach to estimate ν_e energy for signal events.

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