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# Identifying Particles and Neutrino Final States with Convolutional Neural Networks in MicroBooNE

*Tuesday, August 22, 2023 3:30 PM (35 minutes)*

MicroBooNE, a Liquid Argon Time Projection Chamber (LArTPC) located in the  $\nu_\mu$ -dominated Booster Neutrino Beam at Fermilab, has been studying  $\nu_e$  charged-current (CC) interaction rates to shed light on the measured MiniBooNE low energy excess. The LArTPC technology pioneered by MicroBooNE provides the capability to image neutrino interactions with mm-scale precision. Computer vision techniques can be used to process these images and aid in selecting  $\nu_e$ -CC and other rare signals from large cosmic and neutrino backgrounds. We present a new suite of deep learning tools to reconstruct neutrino interactions in MicroBooNE, with a focus on a convolutional neural network used to accurately assign labels to reconstructed particles. We will show that these techniques can be used to select  $\nu_e$ -CC events at purities and efficiencies that are competitive with the tools currently in use in MicroBooNE and that they have the potential to improve the sensitivity of future analyses.

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