

Deep Learning Reconstruction at DUNE Far Detector

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DUNE, the flagship next-generation neutrino experiment in the United States, is designed to decisively measure neutrino CP violation and the mass hierarchy. Its far detector modules utilize Liquid Argon Time Projection Chamber (LArTPC) technology, which provides exceptional spatial resolution and the potential to accurately identify final state particles and neutrino events. However, this enhanced spacial resolution exposes fine details of the neutrino interactions and their final states, which need to be harnessed during event reconstruction to fully utilize the potential of the detector technology. Fortunately, deep learning techniques, in particular convolutional neural networks (CNNs), offer a promising solution. These methods allow the direct reconstruction of neutrino events from images representing interactions. In this talk I will describe the development of deep learning based reconstruction methods at DUNE. I will also discuss the application of deep learning methods to data from the DUNE prototype detector ProtoDUNE at CERN.

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