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Deep Learning Based Event Reconstruction at DUNE

DUNE is the next-generation US flagship neutrino experiment designed to measure neutrino CP violation and mass hierarchy decisively. DUNE's far detectors are based on the liquid argon time projection chamber (LArTPC) technology. LArTPC offers an excellent spatial resolution and potentially allows very good identification of individual particles, but neutrino event reconstruction in LArTPC detectors is challenging. The use of traditional reconstruction methods in LArTPCs can be challenging, however neutrino events can be reconstructed directly from images of the interactions with deep learning methods, such as Convolutional Neural Networks (CNNs). In this talk, I will discuss the development of deep-learning-based reconstruction methods at DUNE. Compared with traditional reconstruction, these methods show a significantly better performance in simulated DUNE data.

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