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Type: **Poster**

Segmentation Neural Networks for Particle Identification in ProtoDUNE

This poster presents the application of sparse convolutional neural networks in three dimensions in the ProtoDUNE Liquid Argon Time Projection Chamber (LArTPC) detector, building on previous applications of the technique in other LArTPCs. Sparse convolutions allow for computationally efficient processing of very large and high-resolution three-dimensional images, making them a natural fit for fine-grained particle detectors. The use of segmentation techniques allows for particle ID to be performed on individual 3D hits, without the need to produce higher-level objects. This poster will discuss input production and network architecture, present training and inference benchmarking on ProtoDUNE simulation, and describe techniques for defining ground truth using the underlying simulation. Particle identification accuracies are presented for a range of particle classes, and the application of this technique for ProtoDUNE cross-section measurements is discussed.

Mini-abstract

3D hit particle identification in ProtoDUNE using sparse neural networks

Experiment/Collaboration

DUNE

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