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Finding Neutrinos in LArTPCs using Convolutional Neural Networks

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Deep learning algorithms, which have emerged over the last decade, are opening up new ways to analyze data for many particle physics experiments. MicroBooNE, which is a neutrino experiment at Fermilab, has been exploring the use of such algorithms, in particular, convolutional neural networks (CNNS). CNNs are the state-of-the-art method for a large class of problems involving the analysis of images. This makes CNNs an attractive approach for MicroBooNE, whose detector, a liquid argon time projection chamber (LArTPC), produces high-resolution images of particle interactions. In this talk, I will discuss the ways CNNs can be applied to tasks like neutrino interaction detection and particle identification in MicroBooNE and LArTPCs.