



Contribution ID: 214

Type: **Poster**

Clustering Cosmic Muon and Neutrino Interactions in MicroBooNE using a Deep Convolutional Neural Network

We explore the use of a deep convolutional neural network called Mask-RCNN to locate, classify and cluster individual instances of cosmic ray muons and neutrino interactions in images from the MicroBooNE liquid argon TPC (LArTPC). Mask-RCNN, widely used in computer vision problems, proposes bounding boxes for objects it finds in a LArTPC image, then classifies each box and proposes a masked region within each corresponding to the identified object. We explore several variations of the network, such as a Sparse Convolutional version of ResNet using transferred dense ImageNet weights in order to increase the speed of the network without a significant change in performance. In addition we utilize transfer learning from one readout plane's training to the other planes. Lastly, we use cosmic ray data in MicroBooNE to evaluate the performance of the network.

Mini-abstract

A deep CNN to locate and cluster cosmic muon and neutrino events in the MicroBooNE detector

Experiment/Collaboration

MicroBooNE

Primary author: MILLS, Joshua (Tufts University)

Presenter: MILLS, Joshua (Tufts University)

Session Classification: Poster session 3