Contribution ID: **28** Type: **Plenary**

Applying Submanifold Sparse CNN in MicroBooNE

Wednesday 22 April 2020 20:35 (25 minutes)

The MicroBooNE experiment employs a Liquid Argon Time Projection Chamber (LArTPC) detector to measure sub-GeV neutrino interactions from the muon neutrino beam produced by the Booster Neutrino Beamline at Fermilab. The detector consists of roughly 90 tonne of liquid argon in which 3D trajectories of charged particles are recorded by combining timing with information from 3 wire planes, each producing a 2 dimensional projected image. Neutrino oscillation measurements, such as those performed in MicroBooNE rely on the capability to distinguish between different flavors of neutrino interactions leading to different types of final state particles. Deep Convolutional Neural Networks (CNNs) present high success for these tasks; however, due to the large sparsity of the data (only < 5% pixels are non-zero), a naive approach of applying CNNs with a standard linear algebra package becomes highly inefficient in both computation time and memory resources. Recently Submanifold Sparse Convolutional Networks (SSCNs) have been proposed to address this challenge and have successfully applied to analyze large LArTPC images in MicroBooNE with orders of magnitude improvement in computing resource usage. In this talk, I will present the performance of SSCNs on the task of Semantic Segmentation applied in the analysis of simulated MicroBooNE data.

Consider for young scientist forum (Student or postdoc speaker)

Yes

Second most appropriate track (if necessary)

Enhanced performance of tracking algorithms

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Session Classification: Recording sessions