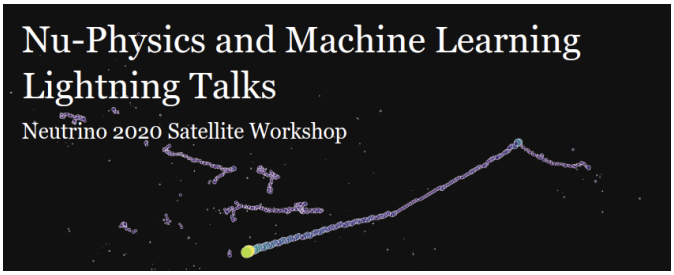

Contribution ID: **7** Type: **not specified**

A Convolutional Neural Network for Multiple Particle Identification in the MicroBooNE LArTPC

Friday, 19 June 2020 11:30 (15 minutes)

MicroBooNE has accumulated data in a 1E21 POT neutrino beam over five years to test the excess of low energy electron neutrino-like events observed by MiniBooNE. To this end, we have explored the use of a new hybrid analysis chain that includes both conventional and machine learning reconstruction algorithms to identify events with the exclusive 1-proton-1-electron signal topology. The multiple-particle-identification (MPID) network we developed is an important application of convolutional neural networks that takes a reconstructed image as input, and provides simultaneous probabilities of having a proton, electron, gamma, muon or charged pion in the image. MPID shows a promising ability to separate the physical features that distinguish interactions, e.g., protons in ν_μ events, and gamma showers from π^0's in ν_eCC interactions. In this talk, we present the highlights of MPID training and performance in both simulated and real datasets.

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Session Classification: Day 2: Morning