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Deep Learning and MicroBooNE to Investigate the MiniBooNE Excess

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MicroBooNE is a liquid argon TPC neutrino experiment based at Fermilab and situated on the Booster Neutrino Beam. MicroBooNE's primary aim is to investigate the excess of electron neutrino-like events seen by the MiniBooNE experiment, which is potential evidence for new non-Standard physics such as sterile neutrinos. This talk will discuss a search for low-energy electron neutrino interactions within the MicroBooNE detector. This analysis features a hybrid approach of traditional reconstruction methods along with a novel application of convolutional neural networks (CNNs), a deep learning algorithm highly adept at pattern recognition. This talk will describe the identification of events and the ways in which the CNNs are used. It will also outline the ways we are addressing issues related to applying CNNs, which are trained on simulated data, to data from the detector

Author: MOON, Jarrett (MIT)

Presenter: MOON, Jarrett (MIT)

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