

Machine learning applications for JUNO

Tuesday 17 September 2019 14:45 (20 minutes)

The new generation neutrino experiment JUNO is a multipurpose experiment with the main goals of determining the hierarchy of neutrino masses and precisely measuring the neutrino oscillation parameters. Thanks to the huge mass of the liquid scintillator target that is equal to 20 kt and 18000 large 20-inch PMTs and 25000 small 3-inch PMTs the detector will collect hundreds of millions of events originating from various interactions and detailed information about each of them. Machine learning methods can provide an effective alternative to the common-used numerical and analytical approaches for event reconstruction, particle identification and candidate selection. Different compositions of the Convolutional Neural Networks (CNN) and the Full Connected Neural Networks (FCNN) are applied for particle identification and muon reconstruction as well as for energy, position and waveform reconstructions of the event. The Long Short-Term Memory neural network (LSTM) which is one of the types of the Recurrent Neural Networks (RNN) may be used for waveform reconstruction.

Presenter: Dr GROMOV, Maxim (SINP MSU, JINR)

Session Classification: Talks