Contribution ID : **234** Type : **Oral talk**

Deep Learning Method for Determining EAS Parameters in TAIGA HiSCORE

Thursday, 24 October 2024 18:15 (15)

The TAIGA-HiSCORE setup is an array of wide-angle Cherenkov detectors. It contains more than a hundred stations located in the Tunka Valley. The effective area of the setup is about 1 sq. km. The HiSCORE setup is designed to register cosmic particles and gamma quanta with TeV energies. Each station records a large amount of data, including the signal arrival time and its amplitude. Primary data analysis includes the reconstruction of EAS parameters. These are the EAS axis direction, the type of primary particle, and its energy. In this report, we propose using the deep learning method to reconstruct the EAS parameters recorded by HiSCORE. Using the example of determining the EAS axis direction, we will consider two approaches based on deep neural networks. One of them is based on representing a set of time stamps as an image and processing such data using convolutional neural networks. The other approach uses fully connected deep neural networks to solve the regression problem based on time stamps. Both approaches are shown to yield results comparable to traditional data analysis methods.

Primary author(s) : KRYUKOV, Alexandr (SINP MSU)

Presenter(s) : KRYUKOV, Alexandr (SINP MSU)

Session Classification : Facilities and advanced detector technologies

Track Classification : Facilities and advanced detector technologies