XII International Conference on New Frontiers in Physics



Contribution ID: 77

Type: Talk

# ANN4FLES: A Neural Network Package for Applications in the CBM Experiment at FAIR

Wednesday, July 19, 2023 11:25 AM (25 minutes)

Artificial Neural Networks for First Level Event Selection (ANN4FLES) in the CBM experiment at FAIR is envisaged as a fast C++ package that enables the user to construct a variety of neural network architectures with minimal additional program- ming. The package comes equipped with a Graphical User Interface (GUI) where the user can not only select the type of network but also adjust the various hyperparameters. The package is designed to be modular so that users who wish to implement additional non-trivial features can do so without changing the basic structure of the package. Currently ANN4FLES can implement the following networks: Multilayer Perceptron (MLP), Convolutional Neural Network (CNN), Recurrent Neural Networks (RNN) and Graph Neural Networks (GNN).

We have tested all networks implemented in the package on many standard datasets like MNIST, CIFAR, Cora etc and compared with PyTorch. In all cases we find the performance of ANN4FLES and PyTorch to be comparable. This gives us confidence that the basic algorithms being implemented are correct.

We give two classification examples of how this package can be used in CBM: for search for short-lived particles and for selection of collisions with Quark-Gluon Plasma.

# Is this abstract from experiment?

Yes

# Name of experiment and experimental site

CBM

### Is the speaker for that presentation defined?

Yes

### Details

Prof. Dr. Ivan Kisel, FIAS, Uni-Frankfurt

### Internet talk

No

Authors: Mr BENDER, Adrian (Uni-Frankfurt); Mr MITHRAN, Akhil (Uni-Frankfurt, FIAS); Mr CORREIA, Anthony (LPNHE); Mr BELOUSOV, Artemiy (FIAS/Uni-Frankfurt); Mr GRIESEMER, Daniel (Uni-Frankfurt); Ms ZISCHKA, Gianna (Uni-Frankfurt); VASSILIEV, Iouri (GSI); Prof. KISEL, Ivan (Johann-Wolfgang-Goethe Univ.

(DE)); Mr GARROUM, Nabil (LPNHE); Mr TYAGI, Oddharak (Uni-Frankfurt, FIAS); Mr DU, Qingyuan (Uni-Frankfurt); Mr LAKOS, Robin (Uni-Frankfurt, FIAS); Mr ZHANG, Tai (Uni-Frankfurt); GLIGOROV, Vladimir (Centre National de la Recherche Scientifique (FR))

Presenter: Prof. KISEL, Ivan (Johann-Wolfgang-Goethe Univ. (DE))

Session Classification: Heavy Ion Collisions and Critical Phenomena

Track Classification: Main topics: Heavy Ion Collisions and Critical Phenomena