Contribution ID: **257** Type: **Oral Presentation**

ML techniques used in LHCb analyses and online applications

Wednesday, 28 August 2019 15:00 (30 minutes)

LHCb collaboration has been pioneering the employment of machine learning in real-time computing, related to the high energy physic field (HEP), since 2015. The LHCb software trigger exploited a novel machine learning techniques based on binned boosted decision tree model that helped to select high-quality physics data in real-time. After that, a major modernisation of the algorithms for tracking, particle identification and offline physics selections using computing intelligence followed. Especially huge improvements of the background rejection factors for numerous physics analyses led to using the multivariate techniques as a standard step in obtaining clean signals within LHCb collaboration. In this presentation, we give a short overview of the tools and techniques based on the machine learning approach by LHCb experiment. We address the issues related to the proper selection of the training and verification data sets that are vital for the final results. One of the critical issues is to keep up with the rapid development of the tools, libraries and new ideas from outside of the HEP domain (mainly based on the ROOT package). Application of third-party software will be discussed through the application of a long-lived particles tracking algorithm that was commissioned and successfully operated during the second data taking a period of the LHCb experiment.

Primary author: DENDEK, Adam Mateusz (AGH Univesity of Science and Technology (PL))

Presenter: DENDEK, Adam Mateusz (AGH Univesity of Science and Technology (PL))

Session Classification: Machine Learning Session