



Contribution ID: 391

Type: LHC experiments

Prototype of Machine Learning “as a Service” for CMS Physics in Signal vs Background discrimination

Tuesday, 5 June 2018 16:00 (1h 30m)

Big volumes of data are collected and analysed by LHC experiments at CERN. The success of this scientific challenges is ensured by a great amount of computing power and storage capacity, operated over high performance networks, in very complex LHC computing models on the LHC Computing Grid infrastructure. Now in Run-2 data taking, LHC has an ambitious and broad experimental programme for the coming decades: it includes large investments in detector hardware, and similarly it requires commensurate investment in the R&D in software and computing to acquire, manage, process, and analyse the shear amounts of data to be recorded in the High-Luminosity LHC (HL-LHC) era.

The new rise of Artificial Intelligence - related to the current Big Data era, to the technological progress and to a bump in resources democratization and efficient allocation at affordable costs through cloud solutions - is posing new challenges but also offering extremely promising techniques. Machine Learning and Deep Learning are rapidly evolving approaches to characterising and describing data with the potential to radically change how data is reduced and analysed, also at LHC.

This contribution documents the construction of a Machine Learning “as a service” solution for CMS Physics needs, namely an end-to-end data-service to serve Machine Learning trained model to the CMS software framework. The proof of concept of a first working prototype of such infrastructure, plus the demonstration on the Signal versus Background discrimination in the study of CMS all-hadronic top quark decays done with scalable Machine Learning techniques, are presented and discussed.

Primary authors: Dr GIOMMI, Luca (INFN); Prof. BONACORSI, Daniele (INFN); Dr KUZNETSOV, Valentin

Presenter: Dr GIOMMI, Luca (INFN)

Session Classification: Posters session