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MLaaS4HEP: Machine Learning as a Service for HEP

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Nowadays Machine Learning (ML) techniques are widely adopted in many areas of HEP and certainly will play a significant role also in the upcoming High-Luminosity LHC (HL-LHC) upgrade foreseen at CERN, when a huge amount of data will be produced by LHC and collected by the experiments, facing challenges at the exascale.

Here, we present a Machine Learning as a Service solution for HEP (MLaaS4HEP) to perform an entire ML pipeline (in terms of reading data, processing data, training ML models, serving predictions) in a completely model-agnostic fashion, directly using ROOT files of arbitrary size from local or distributed data sources.

With the new version of MLaaS4HEP code based on uproot4, we provide new features to improve users' experience with the framework and their workflows, e.g. users can define preprocessing operations to be applied on ROOT data before starting the ML pipeline. Then our approach is extended to use local and cloud resources via HTTP proxy which allows physicists to submit their workflows using the HTTP protocol.

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