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Machine learning in ALICE: status and perspectives

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In the last years, the use of machine learning (ML) techniques has become a fundamental tool to cope with the huge amount of data produced at the Large Hadron Collider (LHC). In particular, machine learning and deep learning methods are employed in ALICE in a wide range of activities, from physics analyses to online data selections, detector calibrations and Monte Carlo simulations.

The variety of application domains is as large as the number of ML algorithms currently used, like, for example, Boosted Decision Trees, Deep Neural Networks and Generative Adversarial Networks. Moreover, the increasing interest in ML techniques leads consequently to a higher demand for dedicated computing resources. In this context, ALICE is also developing a common analysis framework based on ML for the next data taking period (Run 3). Within ALICE, the INFN community is strongly involved in many of these topics, focusing mostly on physics analyses in both the light and the heavy flavour sectors.

In this talk an overview of the main ALICE projects based on ML is given, highlighting the contribution of the INFN community.

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