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Machine Learning tools for Physics Searches at the LHC

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The LHC accelerator and experiments program have lead to rediscovering the Standard Model (SM) in the first months of data taking.
Machine learning techniques have been instrumental to the discovery of the Higgs boson in 2012, and have become crucial in the following era.
On one side precision measurements require precise calibrations, on the other searches for rare SM processes and for beyond-SM processes require sifting to a huge amount of data in search for a very small signal. With these objectives, state-of-the-art machine learning techniques are being applied already.
The ongoing upgrade of the detectors in preparation of Run III also requires data acquisition systems to be prepared for very noisy data; studies for the integration of machine learning techniques in such systems (e.g. trigger), also in hardware-embedded form, are ongoing.
In this talk I will review the use of Machine Learning tools at the LHC, providing a state-of-the-art picture of the topic.

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