



COLLOQUIA DI DOTTORATO, A.A. 2023/2024

Dipartimento di Fisica, Aula 101
Giovedì 16 Maggio 2024 ore 16:00

***Application of Machine Learning
in High Energy Physics:
past, present and future***

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This seminar presents the diverse use of Machine Learning tools and approaches in High Energy Physics. It focuses on the practices of the experiments at the Large Hadron Collider (LHC) at CERN. The LHC experiments use Machine Learning in a wide range of applications. These range from straightforward procedures of trying to differentiate the new physics and known processes in data analysis using e.g. deep neural networks, to using Machine Learning to replace traditional Monte Carlo simulation of physics processes.

State-of-the-art attempts comprise using programmable FPGA chips to implement very fast Machine Learning tools in detector operations, exploring the use of Machine Learning algorithms on Quantum Computers, employ Artificial Intelligence approaches to design the new generations of experiments, solve theoretical equations, etc...

Special emphasis will be given to the implementation of the transfer of latest commercial approaches, such as generative modelling, into scientific procedures with advantages they bring as well as associated caveats. Finally, a speaker's vision of the future of Machine Learning in HEP will be given.

The seminar is in presence up to the maximum occupancy of the lecture hall.