Doing more with less: Deep Learning for Physics at the Large Hadron Collider

Dr Maurizio Pierini
CERN

The CERN Large Hadron Collider produces more data than what the experiments can take. This creates practical problems with the computing infrastructure and conceptual problems with how the LHC ultimate goal (finding evidence of physics beyond the Standard Model) is pursued. With examples, we show how Deep Learning applications can help with this, reducing computing resource needs while extending the experimental sensitivity. We discuss technical challenges we face when deploying such a technology on unconventional equipments like the CMS experiment and the role of Deep Learning in the future High-Luminosity phase of the LHC.

Maurizio Pierini is a member of the CERN research staff, working on the CMS experiment at the Large Hadron Collider since 2007. His main area of interest is the search for physics beyond the Standard Model of particle physics. Since 2018, Dr. Pierini is coordinating an R&D project, funded by an ERC consolidator grant, to develop Deep Learning solutions to the current and future challenges of High Energy Physics at particle colliders. Before joining the CMS experiment, Dr. Pierini worked on the BaBar experiment at the SLAC National Laboratory in Stanford, earning his PhD in 2005 at the University of Rome “La Sapienza”.