



Laboratoire LEPRINCE-RINGUET
Ecole polytechnique IN2P3/CNRS

Séminaire

Generative Models for detector simulation

Machine Learning techniques have been used in different applications by the HEP community: in this talk, we discuss the case of detector simulation.

The need for simulated events, expected in future High Luminosity LHC experiments is increasing dramatically and requires new fast simulation solutions. We will describe R&D activities, aimed at reproducing the detector response and replace standard Monte Carlo simulation with generative models, typically used in computer vision applications. Two common aspects characterize many of these applications: the representation of input data as regular arrays of numerical values and the use of raw data as the input information to feed the network.

Next generation HEP experiments are expected to be more and more characterized by detector components that could comply to this paradigm. Calorimeters of the ILC and CLIC detector concepts are effectively 3D arrays of sensors. We will introduce the first application of three-dimensional convolutional Generative Adversarial Networks to the simulation of highly granular calorimeters. The development of similar strategies to different detector use cases will also be described.

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Responsables séminaires

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