

ML for fast calorimeter simulation

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Generative networks, such as ChatGPT, have recently gained significant popularity. There are also many applications of generative networks in the field of particle physics. One area of active research focuses on the development of fast simulation methods for calorimeters. This research is primarily driven by the experiments conducted at the LHC. In the upcoming HL-LHC phase, a substantial volume of experimental data will be collected. For MC simulation, it is necessary to generate samples with statistics that exceed those of the experimental data, which consumes a significant amount of computational resources. Without conducting relevant research and development, there is a risk of facing a shortage of computational resources.

In traditional Geant4 simulation methods, the simulation of calorimeters is the most time-consuming part. By employing fast simulation methods based on machine learning, it can greatly accelerate this process, thereby addressing the issue of limited computational resources. This presentation will introduce the use of machine learning for fast calorimeter simulation and explore its applications in different experiments.

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