

Fast simulation of the CMS HGCal with Generative Models

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Accurate simulation of the interaction of particles with the detector materials is of utmost importance for the success of modern particle physics. Software libraries like GEANT4 are tools that already allow the modeling of physical processes inside detectors with high precision. The downside of this method is its computational cost in terms of time.

Recent developments in generative machine learning models seem to provide a promising alternative for faster and accurate simulations to accelerate this process. We show the taken steps in the development of a GraphGAN for the simulation of the CMS High Granularity Calorimeter (HGCal) that is being developed for the High-Luminosity upgrade at the LHC.

As a first result, we will show an energy regression using Graph Neural Networks.

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Session Classification: Computing: Machine learning