ID contributo: **3** Tipo: **non specificato**

Denoising Diffusion Models for High Fidelity Calorimeter Simulation

martedì 30 maggio 2023 17:00 (30 minuti)

Denoising diffusion models have recently become state of the art in the ML community because of their stable training procedure and ability to generate high quality images in reasonable computation times. We employ diffusion models for the task of generating calorimeter showers within the context of the CaloChallenge. Our diffusion models are based on 3D cylindrical convolutional networks, which take advantage of symmetries of the underlying data representation. For dataset 1, which has a basic cylindrical geometry but irregular binning between the different layers, we employ a differentiable embedding procedure that learns a reversible mapping from the original data format to a regular geometry on which cylindrical convolutions can be applied. We find our diffusion approach is able to generate high quality showers for all three datasets, achieving classifier AUC scores of ~0.7 or better.

Autori principali: PEDRO, Kevin (Fermilab); AMRAM, Oz (Fermilab)

Relatore: AMRAM, Oz (Fermilab)

Classifica Sessioni: Diffusion