Contribution ID: **63** Type: **YSF oral presentation**

PC-Droid: Jet generation with diffusion

Monday, 30 October 2023 16:10 (10 minutes)

Building on the success of PC-JeDi we introduce PC-Droid, a substantially improved diffusion model for the generation of jet particle clouds. By leveraging a new diffusion formulation, studying more recent integration solvers, and training on all jet types simultaneously, we are able to achieve state-of-the-art performance for all types of jets across all evaluation metrics. We study the trade-off between generation speed and quality by comparing two attention based architectures, as well as the potential of consistency distillation to reduce the number of diffusion steps. Both the faster architecture and consistency models demonstrate performance surpassing many competing models, with generation time up to two orders of magnitude faster than PC-JeDi and three orders of magnitude faster than Delphes.

Brainstorming idea [title]

How to better exploit diffusion models beyond generation

Brainstorming idea [abstract]

Generative modelling and diffusion models in particular have been seen to show impressive capabilities. But I would like to see discussion on how we can use these models better for downstream tasks.

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Session Classification: Young Scientist Forum