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Meta-learning for multiple detector geometry modelling

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High energy physics experiments relies on Monte Carlo simulation to accurately model their detector response. Most of the time dominated by shower simulation in the calorimeter, the detector response modelling is time consuming and CPU intensive especially with the upcoming High Luminosity LHC upgrade. Several research directions investigated the use of Machine Learning based models to accelerate particular detector response simulation. This results in a specifically tuned simulation and generally these models require a large amount of data for training. Meta learning has emerged recently as fast learning algorithm using a small training dataset. In this project, we build a meta-learning model that “learns how to learn” to generate showers using a first-order gradient based algorithm. This model is trained on multiple detector geometries and can rapidly adapt to a new geometry using few training samples.

Significance

References

Speaker time zone

Compatible with Europe

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Session Classification: Track 2: Data Analysis - Algorithms and Tools

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