

# Generative transformers for learning point-cloud simulations

*Tuesday 5 November 2024 16:00 (20 minutes)*

We successfully demonstrate the use of a generative transformer for learning point-cloud simulations of electromagnetic showers in the International Large Detector (ILD) calorimeter. By reusing the architecture and workflow of the “OmniJet-alpha” model, this transformer predicts sequences of tokens that represent energy deposits within the calorimeter. This autoregressive approach enables the model to learn the sequence length of the point cloud, supporting a variable-length and realistic shower development. Furthermore, the tokenized representation allows the model to learn the shower geometry without being restricted to a fixed voxel grid.

## Track

Detector simulation & event generation

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**Session Classification:** Detector Simulation