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SCD: an open, realistic calorimeter for ML studies in HEP

Thursday 27 October 2022 11:00 (30 minutes)

The feature complexity of data recorded by particle detectors combined with the availability of large simulated datasets presents a unique environment for applying state-of-the-art machine learning (ML) architectures to physics problems. We present the Simplified Cylindrical Detector (SCD): a fully configurable GEANT4 calorimeter simulation which mimics the granularity and response characteristics of general purpose detectors at the LHC. The SCD will be released as a public software to accelerate development of ML-based reconstruction and calorimeter models. Two use-cases based on data from the SCD are presented: first, an ML-based global particle reconstruction which shows potential to outperform traditional approaches. Second, a fast simulation model transforming a set of truth particles into a set of reconstructed particles.

Significance

References

Experiment context, if any

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Session Classification: Poster session with coffee break

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