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Generic ML for fast simulations

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In the field of high energy physics, Monte Carlo simulations play a key role in interpreting physics results, as well as the design of new detectors. Leveraging machine learning for fast simulation is essential for generating the required amount of simulated samples. Nevertheless, transitioning from initial models to full-scale productions is usually a very challenging task.

In this talk, we will show how to use Gaussino, an experiment-agnostic core simulation framework, to streamline the incorporation of machine learning models for fast simulations: starting from an early, generic prototype to a fully deployed model used in production at scale. We will also present one of the first implementations of ML-based fast simulation models based on the CaloChallenge initiative, trained and validated on the LHCb electromagnetic calorimeter, and finally integrated within the LHCb simulation framework.

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