

Full Event Particle-Level Unfolding with Variable-Length Latent Variational Diffusion

Thursday 7 November 2024 14:50 (20 minutes)

The measurements performed by particle physics experiments must account for the imperfect response of the detectors used to observe the interactions. One approach, unfolding, statistically adjusts the experimental data for detector effects. Recently, generative machine learning models have shown promise for performing unbinned unfolding in a high number of dimensions. However, all current generative approaches are limited to unfolding a fixed set of observables, making them unable to perform full-event unfolding in the variable dimensional environment of collider data. This talk presents a novel modification of the variational latent diffusion model (VLD) approach to generative unfolding, which allows for unfolding of high- and variable-dimensional feature spaces. The performance of this method is evaluated in the context of semi-leptonic top quark pair production at the Large Hadron Collider.

Track

Unfolding

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Session Classification: Unfolding & Inference