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Generation of Belle II pixel detector background data with a GAN

Monday 4 November 2019 15:15 (15 minutes)

Belle II uses a Geant4-based simulation to determine the detector response to the generated decays of interest. A realistic detector simulation requires the inclusion of noise from beam-induced backgrounds. This is accomplished by overlaying random trigger data to the simulated signal. To have statistically independent Monte-Carlo events a high number of random trigger events are desirable. However, the size of the background events, in particular the part of the pixel vertex detector (PXD), is so large that it is infeasible to record, store, and overlay the same amount as simulated signal events. Our approach to overcome the limitation of the simulation by storage resources is to use a Wasserstein generative adverserial network to generate PXD background data. A challenge is the high resolution of 250x768 pixels of in total 40 sensors with correlations between them. We will present the current status of this approach and assess its quality based on tracking performance studies.

Consider for promotion

No

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