

Reconstructing the energy of electrons and photons using convolutional neural networks

Monday, 6 January 2020 17:40 (20 minutes)

This talk presents a study of the ability of a Convolutional Neural Networks (CNNs) to reconstruct the energy of electrons and photons. The measured energy of electromagnetic calorimeter cells are considered as pixels in an image, which the CNNs use as input along with a few scalar variables providing complementary information from other detectors. The CNNs are trained on simulated data, and subsequently evaluated on simulated samples not included in the training.

The best models improve the energy resolution on electrons (unconverted/converted photons) over the current performance by approximately 21% (29/20%) fairly uniformly across energy and η . The performance of the CNNs are also more robust to increased pile-up, showing a slower deterioration of resolution with increasing $\langle\mu\rangle$.

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Session Classification: submitted talks