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Improving Gamma-ray Angular Resolution with Convolutional Neural Network De-noiser

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Imaging Atmospheric Cherenkov Telescopes (IACT) reconstruct the locations of gamma-ray sources using stereo analysis of images of gamma-ray air showers. The images of gamma-ray showers suffer from the noise fluctuation arises from night-sky brightness. Understanding the quality of an image is crucial for estimating the uncertainty of the gamma-ray arrival direction. In this presentation, we show how to improve the gamma-ray angular resolution by denoising the gamma-ray shower images with a Convolutional Neural Network (CNN) and estimating the direction uncertainty of a gamma-ray event by propagating the location uncertainties of single photoelectrons in the gamma-ray camera frame.

Type of Contribution

talk

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