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The use of convolutional neural networks for processing stereoscopic IACT images in the TAIGA experiment

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Machine learning methods including convolutional neural networks (CNNs) have been successfully applied to the analysis of extensive air shower images from imaging atmospheric Cherenkov telescopes (IACTs). In the case of the TAIGA experiment, we previously demonstrated that both quality of selection of gamma ray events and accuracy of estimates of the gamma ray energy by CNNs are good compared to the conventional Hillas approach. These CNNs used images from a single telescope as input. In our present work we demonstrate that adding data from another telescope results in higher accuracy of the energy estimates and quality of selection. The same approach can be used for arbitrary number of IACTs. All the results have been obtained with the simulated images generated by TAIGA Monte Carlo software.

Keywords

deep learning; convolutional neural networks; gamma astronomy; extensive air shower; TAIGA; stereoscopic mode

Summary

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