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Deep Learning in High Energy Physics

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Data analysis in high energy physics includes solving difficult classification tasks; hence the deep learning approaches such as deep neural networks and convolutional neural networks (CNN) are often used. The core problems of particle identification share many similarities with the problems faced in computer vision. We describe the benefits of CNN in the area of image recognition tasks originating from its ability to learn features from raw image pixels. Following a summary of the core properties of CNN with experiments demonstrating the effectiveness of the approach, we discuss the possible application of CNN to the NOvA neutrino experiment in Fermilab.

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