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Machine Learning Based Tracking Reconstruction in the Muon g-2 Experiment at Fermilab

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The first result of the Fermilab muon g-2 experiment shows that the anomalous magnetic moment of the muon has 4.2 standard deviation between the experimental and theoretical result, which provides a strong evidence for the new physics beyond the Standard Model. The tracking reconstruction plays an important role in many aspects of the experiment. In the Run1 analyses, both the speed and efficiency of the tracking reconstruction are below expectations. Recently, machine learning based tracking reconstruction methods have been well developed, they have the potential to significantly improve the tracking reconstruction speed and efficiency. I preresent a preliminary machine learning based study in the muon g-2 experiment to explore its potential usage in future data analyses.

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