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Use of machine learning techniques in high energy physics

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The large and complex dataset from Large Hadron Collider (LHC) at CERN has led to the application of Machine Learning (ML) techniques in analysing the data. Up until now, most of the methods used to extract useful information from the large datasets have been based on physics intuition built from existing models. By applying advanced data science methodology, we have developed tools for determining achievable classification performance for a variety of relevant physics processes. In this talk, I will review the recent developments, focussing on optimising trigger, object identification and reconstruction, and tagging jets based on initiating particle using ML methods. Applied to searches for new physics processes, these show significant improvement in sensitivity. I will also summarise the challenges faced in implementing these algorithms in experiments.

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Primary author: KAR, Deepak (University of Witwatersrand)

Presenter: KAR, Deepak (University of Witwatersrand)

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