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Design, implementation and reliability of machine learning algorithms in JUNO

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The Jiangmen Underground Neutrino Observatory (JUNO) is a neutrino experiment currently under construction in China. Its main goals are the mass ordering measurement expected to be determined with a 3σ confidence level in 6 years and the precise measurement of the oscillations parameters θ_{12} , Δm_{21}^2 and Δm_{31}^2 (Δm_{32}^2) at the per-mil level. To achieve such precision, JUNO need to reach an energy resolution of 3% at 1 MeV and the best spatial resolution possible for event selection. Alongside the traditional methods such as likelihood maximisation, we are also exploring the usage of machine learning to improve our precision and ensure a robust and coherent reconstruction by having multiple independent algorithms. In this talk, I will discuss and present the different architectures of Neural Networks and Boosted Decision Tree that have been designed to reconstruct neutrino events and discuss their implementation and their reliability.

Author: IMBERT, Leonard (Subatech, Nantes, France)

Presenter: IMBERT, Leonard (Subatech, Nantes, France)

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