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Deeply Learned Preselection of Dijet Higgs Decays at Future Lepton Colliders

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We propose a method to improve the efficiency of preselection in Higgs signal searches at CEPC. For this propose we developed three machine learning algorithms including boosted decision tree algorithm, fully-connected neural networks and convolutional neural networks. Among all these algorithms, we found the fully-connected neural networks gives the best prediction on Higgs signals. Using such algorithms, we improve the signal strength of s-tagging events from cut-based result, $\mu_{ss} \sim 100$, to FCNN result $\mu_{ss} \sim 10$.

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