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## Study of Di-Higgs production process at the LHC in $b\bar{b}\gamma\gamma$ final state.

Monday 12 December 2022 14:00 (1 hour)

Measuring the trilinear Higgs self-coupling parameter  $\lambda_{HHH}$ , which crucially describes the shape of Higgs potential, is among the key mandates at the Large Hadron Collider (LHC) experiments. In proton-proton collisions, this coupling can be probed directly by studying the production of the Higgs boson pair. Due to the rarity of the HH production signal, the analysis usually requires enhancing the signal-to-background ratio in the observed sample by multivariate analysis (MVA) techniques. To this end, we have made a comparative study of several MVA-based classifiers to distinguish the Higgs boson pair (HH) production signal from the dominant irreducible background of top pair associated Higgs boson production in the inclusive final state of  $b\bar{b} + \gamma\gamma$  using an available simulated dataset. Our study indicates better performance of the graph-based Message Passing Neural Network (MPNN) over other classifiers considered. This talk will present the basic features of different networks considered and the results from MPNN.

### Session

Higgs Physics

**Primary author:** JAISWAL, Atul (Tata Inst. of Fundamental Research (IN))

**Presenter:** JAISWAL, Atul (Tata Inst. of Fundamental Research (IN))

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