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Search for a single produced vector-like quark T' decaying into top and Higgs in the full hadronic final state using neural network in Run3 dataset in CMS experiment.

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After the discovery of the Higgs boson in ATLAS and CMS collaborations, the standard model is complete. However, there are still remaining questions that the standard model cannot explain such as dark matter, etc. To understand these phenomena, we need to understand the property of this new particle and extend the standard model. Vector-like quark is one of the new candidates that will extend our physics horizon beyond the standard model explaining the renormalization of the Higgs mass. A dedicated analysis was performed to search the Vector-like quark T'single production and presented access in the full hadronic final state in the 2016 dataset collected in CMS. In this study, we investigate single produced vector-like T'decaying into top quark and Higgs boson in the full hadronic final state, increasing the sensitivity using neural network technique in Run3 dataset.

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