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Title of presentation: Deep Neural Network Approach in Vector Boson Fusion Higgs Boson Analysis at the ATLAS Experiment

Abstract

The ATLAS experiment is a particle detector at the Large Hadron Collider at the European Centre for Nuclear Research in Geneva, Switzerland. High-energy proton-proton collisions accelerated to nearly the speed of light are thoroughly analyzed to learn about the fundamental forces of the universe, and potentially new, yet to be known physics. These high energy collisions yield a colossal amount of data. Deep neural networks are a machine learning technique inspired by the human brain that can find patterns in large datasets. Therefore, using a deep neural network is a promising option for data analysis. The Higgs Boson is the particle that gives other elementary particles mass. We are interested in analyzing the Higgs decaying into a pair of W bosons. The analysis is required to be able to differentiate signal (Higgs to WW) and background events (other decays with the same decay products) in a statistically significant manner.