

Abstract Submitted  
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**Studying High-dimensional Supersymmetry Models with Neural Networks** ALEXANDER KARBO, MICHELLE KUCHERA, Davidson Coll — This research project investigated the feasibility of using neural networks to more easily study high-dimensional supersymmetry models, using the phenomenological Minimal Supersymmetric Standard Model (pMSSM) as the test case. Facilities such as the Large Hadron Collider are currently conducting experiments to search for evidence of physics beyond the Standard Model (BSM); supersymmetry is one of these candidates. Direct methods of searching for evidence of supersymmetry models are intractable due to computational limitations. Bayesian Neural Networks (BNNs) were used to generate predictions directly from a point in the pMSSM parameter space without needing to simulate particle collisions. This work focused on predicting cross-sections resulting from 13TeV proton-proton collisions. The training data was generated fusing the SUSY-HIT and Prospino codes. Once trained, the BNN provides a function for high-energy physicists to more readily explore the parameter space of the pMSSM and other BSM models.

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