

Abstract Submitted
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Calculating Properties of Exotic Hadrons Using Supervised Machine Learning EMMA YEATS, University of Virginia, DUSTIN KELLER, University of Virginia, Jefferson Laboratory — The existence of exotic hadrons, consisting of more than three quarks, has long been speculated by the physics community. However, these particles have incredibly short lifetimes and are difficult to predict, as we currently don't understand enough about them to have a dependable method of estimating their location on the mass spectra line. This research aims to use supervised learning methods, along with the data we currently possess on ordinary hadrons, to propose possible characteristics of exotic hadron configurations. After learning patterns from properties of mesons and baryons, the algorithm will report viable particle configurations and resonances as output data including, for instance, quark content, rest mass and lifetime estimates. In addition, as researchers in nuclear and particle physics have discovered several candidates of these exotic states at accelerator facilities in labs across the world (notably, the recent discoveries of tetraquarks at LHCb) these findings will be compared with the data reported on the exotic candidates that have been detected in laboratories thus far.

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