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PhenoAI and iDarkSurvey: Learning (from) high-dimensional models

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Although the standard model of particle physics is successful in describing physics as we know it, it is known to be incomplete. Many models have been developed to extend the standard model, none of which have been experimentally verified. One of the main hurdles in this effort is the dimensionality of these models, yielding problems in analysing, visualising and communicating results. Because of this, most current day analyses are done using simplified models, but in this process descriptive power is lost. However, by using machine learning on simulated model points, we show that we can overcome these problems and predict both binary exclusion and continuous likelihood in any parameter space. This functionality is implemented in the PhenoAI framework, allowing non-expert users of machine learning to use trained machine learning models in their own analyses. The simulated data can be stored in our new webbased database and model visualisation tool iDarkSurvey. This tool will be open to the scientific to store all calculated model data.

Parallel Session

Supersymmetry: Models, Phenomenology and Experimental Results

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