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String Theory in Greater Paris

Rencontres Théoriciennes

“Supergravité, théorie des cordes et théorie M”

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Deeping-Learning the Landscape

We propose a paradigm to deep-learn the ever-expanding databases which have emerged in mathematical physics and particle phenomenology, as diverse as the statistics of string vacua or combinatorial and algebraic geometry. As concrete examples, we establish multi-layer neural networks as both classifiers and predictors and train them with a host of available data ranging from Calabi-Yau manifolds and vector bundles, to quiver representations for gauge theories. We find that even a relatively simple neural network can learn many significant quantities to astounding accuracy in a matter of minutes and can also predict hithertofore unencountered results. This paradigm should prove a valuable tool in various investigations in landscapes in physics as well as pure mathematics.

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