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Interpreting machine learning functions as physical observables

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We interpret machine learning functions as physical observables, opening up the possibility to apply "standard" statistical-mechanics methods to outputs from neural networks. This includes histogram reweighting and finite-size scaling, to analyse phase transitions quantitatively, as well as the incorporation of predictive functions as conjugate variables coupled to an external field within the Hamiltonian of a system, allowing to induce order-disorder phase transitions in a novel manner. A noteworthy feature of this approach is that no knowledge of the symmetries in the Hamiltonian is required.

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Session Classification: Algorithms (including Machine Learning, Quantum Computing, Tensor Networks)

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