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A Neural Network Approach to Lattice Field Theory

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Upon taking a bosonic quantum field theory in the Hamiltonian formalism and discretizing the field on a lattice, the theory becomes equivalent to a non-relativistic many-body problem. Neural networks have recently been proposed as effective wavefunction parametrizations in numerical searches for ground state solutions of quantum many-body problems using variational Monte Carlo. We introduce a novel way of enforcing Bose-symmetric neural network functions and apply them to study several non-relativistic quantum systems as well as 1+1d ϕ^4 theory non-perturbatively.

Topical area

Algorithms and Artificial Intelligence

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