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## Deep learning for exploring hadron-hadron interactions

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In this study, we introduce deep learning technologies for studying hadron-hadron interactions. To extract parameterized hadron interaction potentials from collision experiments, we employ a supervised learning approach using Femtoscopy data. The deep neural networks (DNNs) are trained to learn the inverse mapping from observations to potentials. To link between experiments and first-principles simulations, we further investigate hadronic interactions in Lattice QCD simulations from the HAL QCD method perspective. Using an unsupervised learning approach, we construct a model-free potential function with symmetric DNNs, aiming to learn hadron interactions directly from simulated correlation functions (equal-time Nambu-Bethe-Salpeter amplitudes). On both fronts, deep learning methods show great promise in advancing our understanding of hadron interactions.

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