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Deep learning and holographic QCD

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Bulk reconstruction in AdS/CFT correspondence is a key idea revealing the mechanism of it, and various methods were proposed to solve the inverse problem. We use deep learning and identify the neural network as the emergent geometry, to reconstruct the bulk. The lattice QCD data such as chiral condensate, hadron spectra or Wilson loop is used as input data to reconstruct the emergent geometry of the bulk. The requirement that the bulk geometry is a consistent solution of an Einstein-dilaton system determines the bulk dilaton potential backwards, to complete the reconstruction program. We demonstrate the determination of the bulk system from QCD lattice/experiment data.

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