

Operator inference combined with neural network to learning nonlinear dynamical systems

Recently, operator inference (OpInf) approaches have got a lot of attention. They aim at constructing reduced-order modeling directly from the data, without requiring a discretized full-order model. In a recent paper [Benner et. al '2020], the OpInf problem for nonlinear systems was considered, where analytic nonlinear functions of the governing equation are known. However, there are many scenarios, where the exact analytical nonlinear function is not known. The question is: can we learn the nonlinear term using a deep neural network, making the learning dynamical system approach completely black-box?

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