A Comparison of Deep Learning-Based Techniques for Solving Partial Differential Equations

ABSTRACT

Obtaining the solutions of high-dimensional partial differential equations (PDEs) seems to be difficult by utilizing the classical numerical methods. Recently, deep neural networks (DNNs) techniques have received special attentions in solving high–dimensional problems in PDEs. In this study, our quest is to investigate some newly introduced data-driven deep learning-based approaches and compare their performance in terms of their efficiency and faster training towards highdimensional PDEs. However, the comparison is carried out based on different activation functions, number of layers and gradient based optimizers. We consider some benchmark problems in our numerical experiments which includes Burgers equation, Diffusion-reaction equation and Allen-Cahn Equations.