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BreuÃŸ, M.</td></tr>
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<tr><th>abstract</th><td>Feedforward neural networks offer a promising approach for solving differential equations. However, the reliability and accuracy of the approximation still represent delicate issues that are not fully resolved in the current literature. Computational approaches are in general highly dependent on a variety of computational parameters as well as on the choice of optimisation methods, a point that has to be seen together with the structure of the cost function. The intention of this paper is to make a step towards resolving these open issues. To this end we study here the solution of a simple but fundamental stiff ordinary differential equation modelling a damped system. We consider two computational approaches for solving differential equations by neural forms. These are the classic but still actual method of trial solutions defining the cost function, and a recent direct construction of the cost function related to the trial solution method. Let us note that the settings we study can easily be applied more generally, including solution of partial differential equations. By a very detailed computational study we show that it is possible to identify preferable choices to be made for parameters and methods. We also illuminate some interesting effects that are observable in the neural network simulations. Overall we extend the current literature in the field by showing what can be done in order to obtain reliable and accurate results by the neural network approach. By doing this we illustrate the importance of a careful choice of the computational setup.</td></tr>
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