عنوان مقاله:

Numerical Solution of ordinary Differential Equations Based on Semi-Taylor by Neural Network improvement

محل انتشار:

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خلاصه مقاله:

In this paper, a new approach is proposed for solving the differential equations of ordinary initial value based on the feed-forward neural network and Semi-Taylor series ordinary differential equation is first replaced by a system of ordinary differential equations. A trial Solution of this System involves two parts. The first part Semi-Taylor series and involves no adjustable parameters. And The second part Satisfies the neural network and adjustable parameters (the weights). Using modified neural network makes that training points should be selected over the open interval (a, b) without training the network in the range of first and end points. Therefore, the calculating volume involving computational error is reduced. In fact, the training points depending on the distance [a, b] selected for training neural networks are converted to similar points in the open interval (a, b) by using a new approach, then the network is trained in these similar areas. In comparison with existing similar neural networks proposed model provides solutions with high accuracy. Numerical examples with simulation results illustrate the effectiveness of the proposed model

کلمات کلیدی:

Ordinary Differential Equations, Semi-Taylor, MLP Neural Network, bfgs Technique