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Article

Improving the performance of constructed neural networks with a pre-train phase

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Abstract

A multitude of problems in contemporary literature are addressed using machine learning models, the most widespread of which are artificial neural networks. Furthermore, in recent years, evolutionary techniques have emerged that identify both the architecture of artificial neural networks and their corresponding parameters. Among these techniques, one can also identify the artificial neural networks being constructed, in which the structure and parameters of the neural network are effectively identified using Grammatical Evolution. In this paper, we propose the use of an additional phase before the start of the construction of the artificial neural network, in which phase a genetic algorithm undertakes to identify initial values for the parameters of the neural network. After the end of this phase, the evolution process is carried out using as initial values those identified in the above process. The proposed work was applied on a series of classification and regression problems founded in the recent literature and it was compared against other methods used for neural network training as wll as against the original neural network construction method.

Keywords: Neural networks; Grammatical Evolution; Genetic algorithms.

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