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Article

Constructing the bounds for neural network training using Grammatical Evolution

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Abstract: Artificial neural networks are widely established models of computational intelligence that have been tested for effectiveness in a variety of real-world applications. These models require fitting a set of parameters through the use of some optimization technique. However, an issue that researchers often face is finding an efficient range of values for the parameters of the artificial neural network. This paper proposes an innovative technique of generating a promising range of values for the parameters of the artificial neural network. Finding the value field is performed by a series of rules for partitioning the original set of values or expanding it, which rules are generated using Grammatical Evolution. After finding a promising interval of values any optimization technique such as a genetic algorithm can be used to train the artificial neural network on that interval of values. The new technique was tested on a wide range of problems from the relevant literature and the results were extremely promising.

Keywords: Neural networks; Genetic algorithms; Grammatical Evolution

Citation: Tsoulos, I,G.; Tzallas, A.; Karvounis, E. Constructing the bounds for neural network training using Grammatical Evolution. *Journal Not Specified* **2023**, *1*, 0. https://doi.org/

Received:
Revised:
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3.1.1. Subsubsection

Bulleted lists look like this:

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Entry 2	Data Data Data	Data Data Data	Data Data Data
Entry 3	Data Data Data	Data Data Data	Data Data Data
Entry 4	Data Data Data	Data Data Data	Data Data Data

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Text.

Text.

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This is the example 1 of equation:

$$a = 1, \tag{1}$$

the text following an equation need not be a new paragraph. Please punctuate equations as regular text.

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$$a = b + c + d + e + f + g + h + i + j + k + l + m + n + o + p + q + r + s + t + u + v + w + x + y + z \tag{2}$$

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Abbreviations

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DOAJ	Directory of open access journals
TLA	Three letter acronym
LD	Linear dichroism

Appendix A

Appendix A.1

The appendix is an optional section that can contain details and data supplemental to the main text—for example, explanations of experimental details that would disrupt the flow of the main text but nonetheless remain crucial to understanding and reproducing the research shown; figures of replicates for experiments of which representative data are shown in the main text can be added here if brief, or as Supplementary Data. Mathematical proofs of results not central to the paper can be added as an appendix.

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Entry 2	Data	Data

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References

1. Author 1, T. The title of the cited article. *Journal Abbreviation* **2008**, *10*, 142–149.
2. Author 2, L. The title of the cited contribution. In *The Book Title*; Editor1, F., Editor2, A., Eds.; Publishing House: City, Country, 2007; pp. 32–58.
3. Author 1, A.; Author 2, B. *Book Title*, 3rd ed.; Publisher: Publisher Location, Country, 2008; pp. 154–196.
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