

Using optimization techniques in Grammatical Evolution

Ioannis G. Tsoulos^{1,*}, Alexandros Tzallas², Evangelos Karvounis³

¹ Department of Informatics and Telecommunications, University of Ioannina, Greece; itsoulos@uoi.gr

² Department of Informatics and Telecommunications, University of Ioannina, Greece; tzallas@uoi.gr

³ Department of Informatics and Telecommunications, University of Ioannina, Greece; ekarvounis@uoi.gr

* Correspondence: itsoulos@uoi.gr;

Abstract: The Grammatical Evolution technique has been successfully applied to a wide range of problems in various scientific fields. However, in many cases, techniques that make use of Grammatical Evolution get trapped in local minima of the objective problem and fail to reach the optimal solution. One simple method to tackle such situations is the usage of hybrid techniques, where local minimization algorithms are used in conjunction with the main algorithm. However, Grammatical Evolution is an integer optimization problem and, as a consequence, techniques should be formulated that are applicable to it as well. In current work, a modified version of the Simulated Annealing algorithm is used as a local optimization procedure in Grammatical Evolution. This approach was tested on the Constructed Neural Networks and a remarkable improvement of the experimental results was shown, both in classification data and in data fitting cases.

Keywords: Grammatical Evolution; Optimization techniques; Neural networks; Evolutionary techniques; Stochastic methods.

Citation: Tsoulos, I.G.; Tzallas A; Karvounis E; Using optimization techniques in Grammatical Evolution. *Journal Not Specified* **2022**, *1*, 0. <https://doi.org/>

Received:

Accepted:

Published:

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Author Contributions: I.G.T., A.T. and E.K. conceived the idea and methodology and supervised the technical part regarding the software. I.G.T. conducted the experiments, employing several datasets, and provided the comparative experiments. A.T. performed the statistical analysis. E.K. and all other authors prepared the manuscript. E.K. and I.G.T. organized the research team and A.T. supervised the project. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Acknowledgments: This research has been financed by the European Union : Next Generation EU through the Program Greece 2.0 National Recovery and Resilience Plan , under the call RESEARCH – CREATE – INNOVATE, project name “iCREW: Intelligent small craft simulator for advanced crew training using Virtual Reality techniques” (project code:TAEDK-06195

Conflicts of Interest: The authors declare no conflict of interest.

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