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Article

Local Crossover: A new genetic operator for Grammatical Evolution

Ioannis G. Tsoulos[1,*], Vasileios Charilogis[2] and Dimitrios Tsalikakis[3]

[1] Department of Informatics and Telecommunications, University of Ioannina, Greece;itsoulos@uoi.gr
[2] Department of Informatics and Telecommunications, University of Ioannina, Greece; v.charilog@uoi.gr
[3] Department of Engineering Informatics and Telecommunications, University of Western Macedonia, 50100 Kozani, Greece;tsalikakis@gmail.com
* Correspondence: itsoulos@uoi.gr

Abstract: In this work, a new genetic crossover operator is proposed, which can be applied to problems solved by the Grammatical Evolution technique. This new operator intensively applies the one - point crossover procedure to randomly selected chromosomes with the aim of drastically reducing their fitness value. To apply the one point crossover method, a set of randomly selected chromosomes is selected from the current population. This new operator was applied to two techniques from the recent literature that exploit Grammatical Evolution: artificial neural network construction and rule construction. In both case studies, an extensive set of classification problems and data fitting problems were used to measure the effectiveness of the proposed genetic operator. The proposed operator significantly improved the performance of the above two machine learning techniques and in many cases there was a drastic reduction in the error in the test set.

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