GECCO-2018

Decision: Reject

Submission: Novelty Search-based Bat Algorithm adjusting Direction and Distance between Solutions for Multimodal Optimization
Contributors: Ishii, Iwase, Sato, Takadama, Takano, Umenai, Uwano

Key for the below column headings: show

Summary of Reviews of pap438s2: Novelty Search-based Bat Algorithm adjusting Direction and Distance between Solutions for Multimodal Optimization

Reviewer	rel	sig	orig	ach	writ	rep	tech	rec	conf
Reviewer 1	4	3	3	3	2	3	3	2-probably accept as poster (2)	3
Reviewer 2	4	4	4	4	4	4	5	5-definitely accept as full paper (5)	5
Reviewer 3	4	2	1	1	1	2	1	1-definitely reject outright (1)	5
Reviewer 4	4	3	2	2	2	2	1	2-probably accept as poster (2)	3
Averages:	**4.0**	**3.0**	**2.5**	**2.5**	**2.3**	**2.8**	**2.5**	**2.5**	**4.0**

Commitee Comments jump

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Comments for Authors:

This paper describes two methods that are applied to the Bat algorithm. The first method is the k-nearest neighbor method and the second the novelty search-based method. Overall, the paper is very poorly written English-wise and thus makes it difficult to follow. The contribution is not well defined, references are missing, measurements are only performed 10 times instead of at least 30 times, and no statistical analysis has been performed. Also, no direct comparison with the canonical Bat algorithm has been conducted. In addition, a paper has sections, not chapters. I would suggest to fix all the issues raised above (experimentation and modification/addition to paper) and then get the manuscript proof-read by someone to get the English writing corrected.

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Comments for Authors:

This paper presents a study of the kNN-BA and NSBA
by combining k-nearest neighbours and other approaches
with the bat algorithm. The approach has new contribution
and the method is described greater detail. The results
are both extensive and convincing, so the paper can be
accepted in principle.

1) If space/page length allows, it's better to add

more detailed literature about BA and kNN.

2) For the hyper-parameter k in both methods, please explain how the parameter is set in simulation?

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Comments for Authors:

This paper attempts to propose a BAT algorithm for multimodal optimization, using k-nearest neighbours and some idea of novelty search. The novelty aspect of the paper is rather limited, as BAT is just another metaheuristic algorithm, and k-nearest neighbours. The so-called "novelty search" (totally different from Kenneth Stanley's novelty search idea) is just another exploration/diversification technique.

There are already too many new metaheuristic algorithms, many of which share very similar ideas, so why we need to introduce yet again just some new combinations of them (with niching ideas)?? There are no fundamental differences anyway.

The writing is also problematic throughout, with numerous errors (not just grammatical errors), eg., "Differential Evolutionary" on page 1?? "This paper is composed of 7 chapters."?? What is "chapter" here?

The figures are of very poor quality.

Experimental results have no statistical analysis, neither comparisons with other state-of-the-arts.

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Comments for Authors:

The authors present two variations of the Bat Algorithm, k-nearest bat algorithm and novelty search bat algorithm. Both exploits a neighbourhood structure among solutions in order to adapt the velocity of the particles and to increase diversity, respectively. A total of eight methods are compared using combinations of the two algorithms. The methods are tested over two functions, Griewan and Rastringin, with satisfactory results according to authors' conclusions.

In my opinion the maturity of the paper it' s not enough to reach the standards of the conference. The main lacks are the following:

- The bibliographic review is poor. Only 8 references are included which it is a proof of the lack of citations of relevant works in this area.
- The experimentation is poor: only two very simple test functions are considered: Griewank and Rastringin. The author should have considered more complex benchmark as CEC2015 for real functions.
- No comparison with state-of-the-art or reference algorithms: the authors only compare different versions of their algorithms but no comparison with state of the art methods is included in order to test how competitive their proposals are.
- The significance of the comparisons is not assessed with non-parametrical tests. I suggest the authors to have a look at the following paper to have a general view of the steps to follow to validate the statistical significance of the results:

J. Derrac, S. García, D. Molina, F. Herrera, A Practical Tutorial on the Use of Nonparametric Statistical Tests as a Methodology for Comparing Evolutionary and Swarm Intelligence Algorithms. Swarm and Evolutionary Computation 1:1 (2011) 3-18

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None