

Swarm Intelligence: A few things you need to know if you want to publish in this journal

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Starting with Volume 11 the following actions will be implemented:

- **Submission letter.** At submission time, all the authors will be asked to declare that the manuscript is not submitted to another journal/conference, that it is free from plagiarism, that it was edited for language, and that a spell checker was used. Papers whose linguistic quality is too low will be rejected without being sent to referees. In the submission letter, the authors are also asked to state in one or two paragraphs what are the main contributions of their manuscript and to suggest at least three possible referees with whom they have no publications or projects in common and with whom they do not share their affiliations.
- **“Natural metaphor articles”.** There is a relatively recent trend that consists in taking a natural system/process and use it as a metaphor to generate an algorithm whose components have names taken from the natural system/process used as metaphor. This algorithm is often advertised as a “new natural metaphor algorithm” and used to solve a specific problem (most of the time an optimization problem). Unfortunately, this approach has become so common that there are now hundreds of so-called “new” algorithms that are submitted (and unfortunately often also published) to journals and conferences every year. The problem is that it often takes a lot of work and effort for editors, and sometime referees, to understand why the authors are using the proposed metaphor, what is really new and what is the same as the old with just a new name, and whether the proposed algorithm is just a small incremental improvement of a known algorithm or a radically new idea. The number of such manuscripts submitted to Swarm Intelligence has greatly increased in the last few years. I have therefore asked the associate editors to pay particular attention to these “natural metaphor” inspired manuscripts and to send them to referees only if the manuscript seems to be of very high quality. In other words, I have asked the associate editors to increase the number of manuscripts that they reject directly so as to decrease the work load on referees, who are a precious resource that we need to protect. However, this is not enough and

we have therefore recently decided that manuscripts submitted to Swarm Intelligence should refrain from “abusing” the natural metaphor approach. For example, optimization algorithms inspired by a natural phenomenon should explain what the natural phenomenon is optimizing and how. The natural phenomenon should be, therefore, a process that is already scientifically understood. Analogies (and nature-based inspiration) need to be matched to a clear, mathematically formal, explanation in terms of computational concepts, such as solutions, objective functions, neighborhoods, perturbations, and so on. It is the responsibility of the authors, and not of the referees, to explain how new nature-inspired proposals differ from already existing methods [1]. Being inspired by a different metaphor is not enough. In particular, it is not acceptable that the motivation for writing an article is the “new metaphor” [2]. Any manuscript that does not follow these guidelines will be rejected with a simple reference to this document as motivation.

- **Experimental methodology.** Most of swarm intelligence research is empirical in nature. Whenever this is the case, it is required that the evaluation of the proposed solution is done following a strict experimental protocol that includes (i) making data sets and the implementation of the used algorithms available to the readers, and (ii) using an appropriate number of experiment repetitions and appropriate statistical procedures to compare results. The performance of swarm intelligence algorithms, especially when used to solve continuous or combinatorial optimization problems, is often strongly dependent on the value of the algorithm parameters. Such values should be set using either sound statistical procedures as those from statistical design [3] or automatic parameter tuning procedures [4, 5, 6]; in all cases the data sets used for the tuning and evaluation phases should be clearly identified and the procedures used for setting the parameters must be reproducible.¹

Another important point is that authors should design their experiments to be as fair as possible. It is not acceptable to simply quote results published from other articles, to compare your new algorithm’s results to these and say that your algorithm is better if the algorithms are not evaluated under the same experimental conditions. Finally, experimental comparisons should not be devoted solely to show that the authors’ new algorithm is the best performing. In fact, way more interesting is to understand and explain why algorithms perform better (or worse). Competitive testing without new insights about the reasons behind the performance of algorithms is of little value and should be avoided [7].

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