

Dear editor:

I am pleased to submit an original research article entitled "Improving the Vector Generation Strategy of Differential Evolution for Large-Scale Optimization" by Carlos Segura, Carlos A. Coello Coello, and Alfredo G. Hernández-Díaz for consideration for publication in Information Sciences. In this paper, we present an innovative work in the field of Differential Evolution (DE). DE is a very efficient metaheuristic that has gained considerable popularity in recent years because of its amazing performance under several experimental conditions. However, it is also known that its performance deteriorates rapidly when applied to large-scale optimization problems. Since the inception of DE, many researchers have detected some potential weaknesses of DE. The DE community has not paid much attention to some of such factors probably because for low-dimensional problem, the effects of these weaknesses are not very significant. We have developed a large study where we have demonstrated that some of these potential weaknesses are the source of the deterioration of performance when dealing with large-scale optimization problems. This discovery, per se, represents a large advance in the field. In addition, we have proposed two algorithmic modifications that alleviate the problems associated to these weaknesses. Experimentation with a set of scalable optimization problems of varying complexities with up to 1,000 dimensions shows the clear advantages of the proposals.

The paper not only includes an extensive empirical analysis, but also a proper literature review and a thorough mathematical analysis. These two parts are very important because they motivate the work, provide advances in the understanding of the inner working of DE and complement the experimental evaluation.

We believe that this manuscript is appropriate for publication by Information Sciences because it matches with the aims and scope of the journal and because it represents a significant advance in the field of DE. This manuscript is the authors' original work and has not been published nor has it been submitted simultaneously elsewhere. Moreover, all authors have checked the manuscript and have agreed to the submission.

Thank you for your consideration.

Sincerely,
Carlos Segura