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Success rate group search optimiser

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Abstract

The group search optimiser (GSO) algorithm is a newly found evolutionary algorithm that is inspired by animal-searching behaviour and group living theory. The GSO algorithm follows the producer–scrounger framework that consists of producer, scrounger and ranger members. There are multiple key parameters in the GSO algorithm that directly affect the performance of the algorithm. Among these parameters, the maximum pursuit distance parameter plays an important role because it determines the step length of the producer and rangers of the GSO algorithm. In this paper, we develop a modified GSO algorithm by using the success rate model to adjust the maximum pursuit distance parameter of the algorithm. We test the proposed algorithm on a rich set of benchmark functions including 30- and 300-dimensional problems and compare the results with popular evolutionary and swarm algorithms. The experimental results demonstrate that the scanning mechanism of the proposed algorithm quickly optimises not only the 30-dimensional problems but also the high-dimensional (300D) problems.

Keywords:

- evolutionary algorithms,
- group search optimiser,
- success rate,
- swarm intelligence