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A novel artificial bee colony algorithm with local and global information interaction

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Highlights:

- A novel search equation is proposed to realize a local information interaction for the employed bees.
- A global information interaction is designed for the onlooker bees with two novel search equations and an adaptive selection mechanism.
- Our algorithm outperforms several state-of-the-art ABC variants on most of test functions.

Abstract: The artificial bee colony algorithm (ABC) is a new stochastic and population-based optimization method, which has been attracting a great deal of attention, due to its simple structure, easy implementation and outstanding performance. However, it also suffers from slow convergence like other evolutionary algorithms. In order to address this concerning issue, in this paper, we propose a novel artificial bee colony algorithm with local and global information interaction, called ABCLGII. In employed bee phase, each employed bee is designed to learn from the best individual among its neighbors or in a local visible scope. By this way, the search of employed bees is no longer independent and blind, but is cooperative and directional, such that a local information interaction mechanism is conducted between employed bees. In onlooker bee phase, only a part of superior food sources have chance to attract onlooker bees to exploit in their vicinity. Moreover, two novel search equations are proposed for onlooker bees to generate candidate food sources. Specifically, one exploits the useful information of

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