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Improved butterfly optimization algorithm based on Lévy flight.  (Chinese. English summary)

Summary: The butterfly optimization algorithm is an intelligent optimization algorithm that imitates the foraging behavior of butterflies, making full use of the butterfly’s sense of smell to determine the location of the food source. However, this algorithm, like other intelligent algorithms, has some shortcomings and deficiencies such as slow convergence speed and low solving accuracy. The principle of butterfly optimization algorithm mainly imitates the butterfly population to find food. Each butterfly emits a certain concentration of aroma, and each butterfly senses the smell of other butterflies around it and moves toward those that emit more fragrance. This paper proposes an improved butterfly optimization algorithm based on Lévy flight, because Lévy flight is a random walk and can move randomly in any direction for any length at a point in any dimension of space. The Lévy flight search operator is introduced into the butterfly search process to improve the local search and global search capabilities of the original algorithm. Finally, the results show that the convergence speed and solving precision are improved by standard test function.

MSC:
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butterfly optimization algorithm; Lévy flight; standard test function; stimulus intensity