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Fish Swarm Search Algorithm: A New Algorithm for Global Optimization

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Abstract

Optimization is amongst the most significant problems in mathematics and sciences and many researchers are investigating different aspects of this problem. In this paper, a novel algorithm has been proposed for optimization in continuous static environments based on the individual and social behaviors of fish in their swarms. The proposed algorithm, so called Fish Swarm Search Algorithm (FSSA), is a population-based algorithm that can considered among swarm intelligence, evolutionary and meta-heuristic approaches. In the proposed algorithm, there is a population of fish in which every individual fish moves toward better positions in the problem space by following better members of the population and performing a random search in the individual space. The proposed algorithm involves several advantages i.e. better intelligibility, simplicity, high convergence rate, high reliability, high balance between exploration and exploitation, and maintaining diversity in the swarm. There is only one parameter, namely population size, which needs to be initialized in the proposed algorithm in order to start the optimization process, which results in a considerable simplicity of the proposed. The proposed algorithm has been compared with nine other well-known algorithms in this domain on thirty benchmark functions with Unimodal, Multimodal, Shifted and Rotated characteristics. The experimental results and analysis reveals the superiority of the proposed method, compared to other comparative studies.

Keywords

Fish swarm Search Algorithm, swarm intelligence, meta-heuristic methods, natural inspired algorithms.

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