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A New Algorithm Based on Improved Artificial Fish Swarm Algorithm for Data Clustering

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Abstract

Artificial Fish Swarm Algorithm (AFSA) is one of the state-of-the-art swarm intelligence approaches that is widely used for optimization purposes. On the other hand, data clustering is an unsupervised classification technique which has been addressed by researchers in many disciplines and in many contexts. The contribution toward this study is twofold. First, weak points of standard AFSA including lack of using previous experiences of AFs during optimization process, lack of existing balance between exploration and exploitation and high computational load were investigated in order to present a New Artificial Fish Swarm Algorithm (NAFSA). For resolving the weak points, functional behaviors and the overall procedure of AFSA have been improved. In addition, some parameters are eliminated and several supplementary parameters are added. Subsequently, a hybrid clustering algorithm was proposed based on NAFSA and k-means approaches. This combination leads to maximum utilization of the involved approaches for data clustering. The proposed methods were evaluated on several datasets and its efficiency was compared with that of several state-of-art algorithms in this domain. Results showed high efficiency of the proposed algorithm.

Keywords

Artificial Fish Swarm Algorithm, Data Clustering, K-means, Swarm Intelligence, Optimization.

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