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A novel hybridization strategy for krill herd algorithm applied to clustering techniques

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Abstract

Krill herd (KH) is a stochastic nature-inspired optimization algorithm that has been successfully used to solve numerous complex optimization problems. This paper proposed a novel hybrid of KH algorithm with harmony search (HS) algorithm, namely, H-KHA, to improve the global (diversification) search ability. The enhancement includes adding global search operator (Improvise a new solution) of the HS algorithm to the KH algorithm for improving the exploration search ability by a new probability factor, namely, Distance factor, thereby moving krill individuals toward the best global solution. The effectiveness of the proposed H-KHA is tested on seven standard datasets from the UCI Machine Learning Repository that are commonly used in the domain of data clustering, also six common text datasets that are used in the domain of text document clustering. The experiments reveal that the proposed hybrid KHA with HS algorithm (H-KHA) enhanced the results in terms of accurate clusters and high convergence rate. Mostly, the performance of H-KHA is superior or at least highly competitive with the original KH algorithm, well-known clustering techniques and other comparative optimization algorithms.

Keywords: Krill herd algorithm, Hybridization, Global exploration, Data clustering, Text clustering

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