

عنوان مقاله:

A Multi-Objective Approach to Fuzzy Clustering using ITLBO Algorithm

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خلاصه مقاله:

Data clustering is one of the most important areas of research in data mining and knowledge discovery. Recent research in this area has shown that the best clustering results can be achieved using multi-objective methods. In other words, assuming more than one criterion as objective functions for clustering data can measurably increase the quality of clustering. In this study, a model with two contradictory objective functions based on maximum data compactness in clusters (the degree of proximity of data) and maximum cluster separation (the degree of remoteness of clusters' centers) is proposed. In order to solve this model, a recently proposed optimization method, the Multi-objective Improved Teaching Learning Based Optimization (MOITLBO) algorithm, is used. This algorithm is tested on several datasets and its clusters are compared with the results of some single-objective algorithms. Furthermore, with respect to noise, the comparison of the performance of the proposed model with another multi-objective model shows that it is robust to noisy data sets and thus can be efficiently used for multi-objective fuzzy clustering.

کلمات کلیدی:

Fuzzy clustering, Cluster validity measure, Multi-objective optimization, meta-heuristic algorithms, Improved Teaching-Learning Based Optimization

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