Optimizing Fuzzy Clustering With Differential Evolution Algorithm

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Abstract

Clustering (or cluster analysis) aims to organize a collection of data items into clusters, such that items within a cluster are more "similar" to each other than they are to items in the other clusters.Clustering is a typical unsupervised learning technique for grouping similar data points. In hard clustering, data is divided into distinct clusters, where each data element belongs to exactly one cluster but in fuzzy clustering (also referred to as soft clustering), data elements can belong to more than one cluster, and associated with each element is a set of membership levels. FCM can be easily trapped into local optima and solution is sensitive to initialization. Evolutionary algorithm can be used for optimizing of fuzzy clustering, one of them is Differential Evolution Algorithm. Differential evolution (DE) algorithm is a novel evolutionary algorithm (EA) for global optimization, where the mutation operator is based on the distribution of solutions in the population. The proposed system used the differential evolution for fuzzy clustering..Four type of UCI datasets are used for both algorithms.