Particle Swarm Optimization Algorithm and Its Application to Clustering Analysis

Clustering analysis is applied generally to Pattern Recognition, Color Quantization and Image Classification. It can help the user to distinguish the structure of data and simplify the complexity of data from mass information. The user can understand the implied information behind extracting these data. In real case, the distribution of information can be any size and shape. A particle swarm optimization algorithm-based technique, called PSO-clustering, is proposed in this article. We adopt the particle swarm optimization to search the cluster center in the arbitrary data set automatically. PSO can search the best solution from the probability option of the Social-only model and Cognition-only model. This method is quite simple and valid, and it can avoid the minimum local value. Finally, the effectiveness of the PSO-clustering is demonstrated on four artificial data sets.