

Model of Optimal Centroids Approach for Multivariate Data Classification

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Abstract : Particle swarm optimization (PSO) is a population-based stochastic optimization algorithm. PSO was inspired by the natural behavior of birds and fish in migration and foraging for food. PSO is considered as a multidisciplinary optimization model that can be applied in various optimization problems. PSO's ideas are simple and easy to understand but PSO is only applied in simple model problems. We think that in order to expand the applicability of PSO in complex problems, PSO should be described more explicitly in the form of a mathematical model. In this paper, we represent PSO in a mathematical model and apply in the multivariate data classification. First, PSO's general mathematical model (MPSO) is analyzed as a universal optimization model. Then, Model of Optimal Centroids (MOC) is proposed for the multivariate data classification. Experiments were conducted on some benchmark data sets to prove the effectiveness of MOC compared with several proposed schemes.

Keywords : analysis of optimization, artificial intelligence based optimization, optimization for learning and data analysis, global optimization

Conference Title : ICCOMS 2020 : International Conference on Computational Optimization, Modelling and Simulation

Conference Location : London, United Kingdom

Conference Dates : June 29-30, 2020