



Differential Search Algorithm-based Parametric Optimization of Fuzzy Generalized Eigenvalue Proximal Support Vector Machine

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Abstract:

Support Vector Machine (SVM) is an effective model for many classification problems. However, SVM needs the solution of a quadratic program which require specialized code. In addition, SVM has many parameters, which affects the performance of SVM classifier. Recently, the Generalized Eigenvalue Proximal SVM (GEPSVM) has been presented to solve the SVM complexity. In real world applications data may affected by error or noise, working with this data is a challenging problem. In this paper, an approach has been proposed to overcome this problem. This method is called DSA-GEPSVM. The main improvements are carried out based on the following: 1) a novel fuzzy values in the linear case. 2) A new Kernel function in the nonlinear case. 3) Differential Search Algorithm (DSA) is reformulated to find near optimal values of the GEPSVM parameters and its kernel parameters. The experimental results show that the proposed approach is able to find the suitable parameter values, and has higher classification accuracy compared with some other algorithms.

Keywords:

Support Vector Machines Generalized Eigenvalues Proximal Classifier Fuzzy Data Classification Differential Search Algorithm Kernel Function.

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