Support Vector Machines with Weighted Powered Kernels for Data Classification

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Abstract:

Abstract. Support Vector Machines (SVMs) are a popular data classification method with many diverse applications. The SVMs performance depends on choice a suitable kernel function for a given problem. Using an appropriate kernel; the data are transform into a space with higher dimension in which they are separable by an hyperplane. A major challenges of SVMs are how to select an appropriate kernel and how to find near optimal values of its parameters. Usually a single kernel is used by most studies, but the real world applications may required a combination of multiple kernels. In this paper, a new method called, weighted powered kernels for data classification is proposed. The proposed method combined three kernels to produce a new combined kernel (WPK). The method used Scatter Search approach to find near optimal values of weights, alphas and kernels parameters which associated with each kernel. To evaluate the performance of the proposed method, 11 benchmark are used. Experiments and comparisons prove that the method given acceptable outcomes and has a competitive performance relative to a single kernel and some other published methods

Keywords:

Support Vector Machine, Scatter Search, Classification

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