

## Knowledge based support vector machines

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Support vector machines (SVMs), especially nonlinear SVMs, are known to have high performance as classifiers of data. In this paper, we propose to construct a nonlinear SVM from a set of available prior knowledge on the problem domain and to determine their weights by using training data set, which call the knowledge based SVM (KSVM). A basic tool for KSVM is the reduced SVM (RSVM) proposed by Y. -J. Lee and O. L. Mangasarian, in which kernel functions represent such knowledge. A KSVM has an advantage that its behavior is highly understandable as we can see how the kernels representing prior knowledge are combined into a classifier. It is confirmed by computational experiments that KSVMs can have high performance. We also discuss the separability condition and the VC dimension of KSVM.

Keywords: SVM, RSVM, Prior knowledge, VC dimension