

SVM BASED PATTERN CLASSIFIER THROUGH CLUSTERING

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ABSTRACT

The concept of Support Vector Machines (SVMs) for classification and regression has been introduced by Vapnik in 1995. The classification algorithm proposed by Vapnik was intended as binary classification for linearly separable input data and the solution was to find an Optimal Separating Hyperplane (OSH). Very often the input data is not linearly separable. SVMs employ a technique commonly known as the kernel trick to address this problem. In this paper, we propose a pattern classifier topology which includes: a) Pattern generator able to produce a set of two- and three-dimensional patterns with desired characteristics; b) An incorporated Graphical User Interface (GUI) in order to perform learning by using different types of kernels and compare the results; c) We introduce an approach for preliminary clustering of the training set in order to avoid some limitations of traditional SVM algorithms; d) Visualization for two and three-dimensional case to facilitate the interpretation of the results. As demonstrated in the experiment section, the fitting ability of the kernel depends greatly on the characteristics of the input as well as on the parameter selection. The proposed classifier was tested on generated and well-known benchmark datasets.