

# PERFORMANCE OF THE SUPPORT VECTOR MACHINES FOR MEDICAL CLASSIFICATION PROBLEMS

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## **Abstract**

In the Support Vector Machines classification technique the best possible discriminating hyperplane between two populations is looked for by maximizing of margin between the populations' closest points. This idea is also applied for obtaining nonlinear discriminant boundaries by using different kernels for transformations, thus obtaining a nonlinear Support Vector Machines method. The nonlinear Support Vector Machines method is based on pre-processing of data to represent patterns in high dimension- usually much higher than the original variable feature space.

In the presented work the dependency of Support Vector Machines performance on the kind of kernel and Support Vector Machines parameters is presented. The performance was assessed by resubstitution, 10- fold cross-validation, leave-one-out error, learning curves and Receiver Operating Characteristic curves. The kind and shape of the kernel is more important than regularization constant allowing different levels of overlapping classes. Combining boosting and Support Vector Machines did not improved performance in comparison to Support Vector Machines method alone, because both Support Vector Machines procedure and boosting are focused on observations difficult to classify.

**Keywords:** Support Vector Machines, regularizing constant, kernel function, kernel parameter selection