IMPLEMENTATION OF SUPPORT VECTOR MACHINE WITH PRUNING OPTIMIZATION FOR PATTERN CLASSIFICATION PROBLEM

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Abstract

Support Vector Machine (SVM) is an important topic in many areas such as pattern recognition, image processing, machine learning and bioinformatics. SVM has several weakness. One of the weakness is the difficulty of SVM use when completing large-scale problems. The purpose of the definition of a large scale is related to the number of samples processed.

To resolve this problem so that the SVM classifiers can be used as quickly, the Final Project will be proposed a method that can resolve the problem based on the properties of support vectors which can eliminate duplicate training vectors at the same time. The preferred method is SVM with Sequential Minimal Optimization (SMO) using pruning process. Pruning process based on Gaussian modeling and projection process.

The experiment test on this Final Project uses color images. From the test results, this method has an average accuracy which is 97.14% and an average computation time is 13 times faster than the usual SVM method which is 19.64 seconds. From the results obtained, it can be concluded that the method used in the Final Project is able to perform the pattern
classification which could distinguish between object and background with faster computation time without affecting the accuracy of the value of the classification results.

**Keywords:** Support Vector Machine, Sequential Minimal Optimization, Pruning, Pattern Classification