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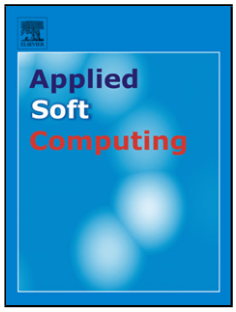

Title: A Robust Semi-Supervised SVM via Ensemble Learning

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A Robust Semi-Supervised SVM via Ensemble Learning

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Abstract

Semi-supervised learning is one of the most promising learning paradigms in many practical applications where few labeled samples are available. Among such learning models, semi-supervised support vector machine (SVM) is a typical and prominent one. However, the typical semi-supervised SVM cannot avoid estimating the distribution of positive and negative samples. In this paper, we put forward a method with the name of EnsembleS3VM which deals with the unknown distribution by ensemble learning. It builds a semi-supervised SVM model composed of base learners based on different disturbance factors, and raises an ensemble method based on clustering evaluation means. Meanwhile, it presents a combination of two multi-classification strategies in order to reduce the running time and enhance the classification accuracy simultaneously. The proposed method can deal with semi-supervised classification problems even with unknown distribution or unbalanced data. Experiments on UCI datasets prove the effectiveness of ensemble strategy and the robustness under different sample distributions. We also apply the proposed algorithm to a practical application, i.e., ground cover classification for polarimetric synthetic aperture radar images which is a typical but difficult semi-supervised classification problem.

Keywords: semi-supervised SVM, disturbance factor, base learner, ensemble learning

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