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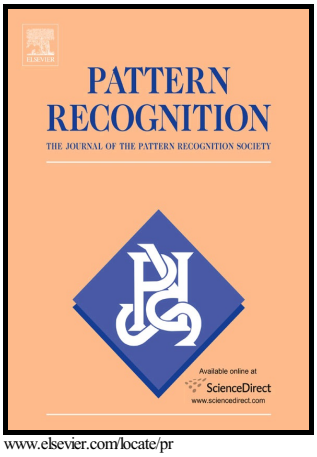

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Abstract

The support vector machine (**SVM**) is a popular classifier in machine learning, but it is not robust to outliers. In this paper, based on the Correntropy induced loss function, we propose the rescaled hinge loss function which is a monotonic, bounded and nonconvex loss that is robust to outliers. We further show that the hinge loss is a special case of the proposed rescaled hinge loss. Then, we develop a new robust SVM based on the rescaled hinge loss. After using the half-quadratic optimization method, we find that the new robust SVM is equivalent to an iterative weighted SVM, which can help explain the robustness of iterative weighted SVM from a loss function perspective. Experimental results confirm that the new robust SVM not only performs better than SVM and the existing robust SVMs on the datasets that have outliers, but also presents better sparseness than SVM.

Keywords:
Support vector machine, Robustness, Rescaled hinge loss, Half-quadratic optimization

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