62th Article Title: Stochastic multi-class support vector machine: behavior in dealing with outliers

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Abstract: This study examines the effectiveness of stochastic multi-class support vector machine (SVM) in handling outliers. Outliers, which deviate significantly from most data, can negatively impact classification accuracy. In this paper, the constraints are in the probabilistic form, so to release the probabilistic state we use statistical tools and theorems. Hence, entering the median into the SVM structure enhances the algorithm's robustness and generalization capabilities, reducing sensitivity to noisy data. A real-world breast ductal carcinoma dataset demonstrates that stochastic multi-class SVM outperforms traditional deterministic SVM in rich environments. This research highlights the potential of stochastic approaches to improve the efficiency of SVM where data irregularities are common.

Keywords: Multi-class SVM، Median، Outlier، Probabilistic constraint