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Robust Location Model for Mixed-Variable Classification under Data Contamination

Communication Info

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Abstract

The Location Model (LM) is a powerful tool specifically designed to simultaneously classify mixed-variable data [1]. However, the classical LM is highly susceptible to data contamination [2], as outliers can distort estimates of the location and scale parameters. Such distortions lead to biased results and high misclassification rates [3]. Therefore, in this study, we developed the RLM_{WMOMSR}, as a robust extension of the LM framework, with the main objective to enhance LM performance under contaminated conditions. This approach integrates the WMOM estimator with a robust covariance matrix into the LM framework to mitigate the influence of outliers while maintaining the LM's ability for mixed-variable classification. Through performance evaluation, we found that the RLM_{WMOMSR} consistently outperforms the classical LM and remains competitive to existing classification methods. These results highlight RLM_{WMOMSR} as an alternative for classification tasks involving mixed variables and outlier problems.

References

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