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Robust Variable Selection Based on Schwarz Information Criterion for Linear Regression Models

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Abstract : The Schwarz information criterion (SIC) is a popular tool for selecting the best variables in regression datasets. However, SIC is defined using an unbounded estimator, namely, the least-squares (LS), which is highly sensitive to outlying observations, especially bad leverage points. A method for robust variable selection based on SIC for linear regression models is thus needed. This study investigates the robustness properties of SIC by deriving its influence function and proposes a robust SIC based on the MM-estimation scale. The aim of this study is to produce a criterion that can effectively select accurate models in the presence of vertical outliers and high leverage points. The advantages of the proposed robust SIC is demonstrated through a simulation study and an analysis of a real dataset.

Keywords : influence function, robust variable selection, robust regression, Schwarz information criterion
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