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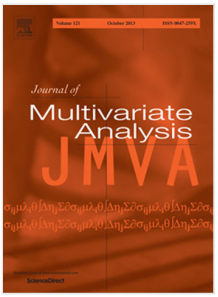

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Model-Free Sure Screening via Maximum Correlation

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Abstract

For screening features in an ultrahigh-dimensional setting, we develop a maximum correlation-based sure independence screening (MC-SIS) procedure, and show that MC-SIS possesses the sure screen property without imposing model or distributional assumptions on the response and predictor variables. MC-SIS is a model-free method in contrast with some other existing model-based sure independence screening methods in the literature. Simulation examples and a real data application are used to demonstrate the performance of MC-SIS and to compare MC-SIS with other existing sure screening methods. The results show that MC-SIS can outperform those methods when their model assumptions are violated, and remain competitive when the model assumptions are satisfied.

Key Words: B-spline; Distance correlation; Optimal transformation; Sure screening property; Variable selection.

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