



Editorial

HOW TO MODEL THE COMPLEX WORLD?

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Regression analysis is a powerful tool to describe the relationship between response and predictors. In practice, parametric regression models such as linear regression models are widely used due to their simplicity and interpretability. When a parametric regression model is correctly fitted by the data, further statistical analysis can be easily and accurately elaborated with good explanations. However, such further analysis and interpretation could be misleading when the model does not fit the data well. A practical example is production theory in economics, in which the Cobb-Douglas function is commonly used to describe the linear relationship between the log-in puts, such as labor and capital, and the log-output. However, this function may not well describe the relationship. To avoid model misspecification, nonparametric regression models are developed. The models are very flexible, but lose some interpretability. Further, when the dimension of predictors is large, the estimation results obtained from nonparametric regression models can be very poor. This is documented as the curse of dimensionality. As a compromise, semi-parametric regression models are introduced. The models include partial linear regression model, single index model, additive model, varying coefficient model, and so on. These semi-parametric regression models describe the relationship between the response and the predictors in a semi-parametric approach. That is, some features are specified in details and other parts are not. This makes the modeling process not only simple but also flexible enough.

The journal Advanced Calculation and Analysis welcomes contributions to all aspects of regression modeling, including model selection, model average, model checking, predicting, variable selection, semi/non-parametric regression models, regression models for missing, censored, functional and high-dimensional data. Advanced Calculation and Analysis is particularly interested in papers motivated by, and fit for, contemporary data analytic challenges. Methods should be validated through standard mathematical arguments that may be complemented with asymptotic arguments or computer-based experiments. Illustrations with relevant, original data are strongly encouraged when presented with clear contextual justification and explanation.



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