Contribution ID: **60** Type: **not specified**

Bayesian Estimation in Regression Models with Restricted Parameter Spaces

Monday, 11 September 2023 13:50 (20 minutes)

Regression models have become increasingly important in a range of scientific fields, but accurate parameter estimation is crucial for their use. One issue that has recently emerged in this area is the estimation of parameters in linear or generalized linear models when additional information about the parameters limits their possible values. One issue that has recently emerged in this area is the estimation of parameters in linear or generalized linear models when additional information about the parameters limits their possible values. Most studies have focused on parameter spaces limited by the information that can be expressed as $H\beta = r$. However, in some fields, such as applied economics or hyperspectral analysis, parameters must be non-negative, which can be expressed as $H\beta \leq r$. In such situations, classical inference methods may not be suitable, and Bayesian inference can be a better alternative. In this paper, we explore techniques that have been developed to estimate parameters, along with their drawbacks, including accuracy and time consumption. We then introduce new algorithms that have been developed to address these issues, and we present simulation studies demonstrating their efficacy. Finally, we illustrate the performance of these new algorithms with practical examples.

Keywords

Regression model, Bayesian Estimator, truncated normal distribution

Classification

Both methodology and application

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Session Classification: CONTRIBUTED Modelling 1

Track Classification: Modelling