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Least absolute deviations estimation for uncertain regression with imprecise observations.
(English) Zbl 1443.62195

Summary: Traditionally regression analysis answers questions about the relationships among variables based on the assumption that the observation values of variables are precise numbers. It has long been dominated by least squares, mostly due to the elegant theoretical foundation and ease of implementation. However, in many cases, we can only get imprecise observation values and the assumptions upon which the least squares is based may not be valid. So this paper characterizes the imprecise data in terms of uncertain variables and proposes a novel robust approach under the principle of least absolute deviations to estimate the unknown parameters in uncertain regression models. Furthermore, some general estimate approaches are also explored. Finally, numerical examples illustrate that our estimate is more robust than the least squares implying it is more suitable to handle observations with outliers.

MSC:
62J02 General nonlinear regression
65K05 Numerical mathematical programming methods
90C05 Linear programming
65D10 Numerical smoothing, curve fitting
41A50 Best approximation, Chebyshev systems

Keywords:
uncertain regression; least absolute deviations; uncertainty theory; imprecise observation

Full Text: DOI

References:


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