Outlier Resistant Model Robust Regression

by

Christopher Ashley Assaid

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Jeffrey B. Birch, Chair
Raymond H. Myers
Eric P. Smith
Clint W. Coakley
George R. Terrell

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(ABSTRACT)

Parametric regression fitting (such as OLS) to a data set requires specification of an underlying model. If the specified model is different from the true model, then the parametric fit suffers to a degree that varies with the extent of model misspecification. Mays and Birch (1996) addressed this problem in the one regressor variable case with a method known as Model Robust Regression (MRR), which is a weighted average of independent parametric and nonparametric fits to the data. This paper was based on the underlying assumption of "well-behaved" (Normal) data. The method seeks to take advantage of the beneficial aspects of the both techniques: the parametric, which makes use of the prior knowledge of the researcher via a specified model, and the nonparametric, which is not restricted by a (possibly misspecified) underlying model.

The method introduced here (termed Outlier Resistant Model Robust Regression (ORMRR)) addresses the situation that arises when one cannot assume well-behaved data that vary according to a Normal distribution. ORMRR is a blend of a robust parametric fit, such as M-estimation, with a robust nonparametric fit, such as Loess. Some properties of the method will be discussed as well as illustrated with several examples.

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