

Robust Estimation and Influence Diagnostics for Several Measuring Devices

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Abstract Robust estimation for several measuring devices under the Grubbs' model by assuming scale mixtures of normal distributions for the errors is developed in this paper. The Grubbs' model has been studied under the assumption of normal errors, which makes the inference vulnerable to outlying observations whereas scale mixtures of normal distributions have been an interesting alternative to produce robust estimates keeping the elegance and simplicity of the maximum likelihood theory. An EM-type algorithm is developed for the parameter estimation of the Grubbs' model. The algorithm is numerically stable and very simple to be implemented. In addition, procedures of local influence are developed for assessing the robustness aspects of the parameter estimates under some usual perturbation schemes. Finally, an example in which Grubbs' models are compared under normal and scale mixture of normal errors is given for the purpose of illustration.

Key words: Grubbs' model; Heavy-tailed distributions; Outliers; Regression diagnostics; Robust estimation.

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