Robustness issues for confidence intervals

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1 Abstract

In many inference problems, it is of interest to compute confidence intervals or regions for the parameters of interest in the model under consideration. As with point estimation, it is important to know about the robustness of the confidence intervals. This involves evaluating the performance of the interval in terms of coverage and length in the face of small perturbations of the data or the model. Ideally we would like a procedure which gives efficient intervals and accurate coverage in the neighborhood of the model. In this talk, we will address the issues of robustness for confidence intervals and assess the robustness of some particular intervals. We will propose several measures including empirical influence function, gross-error sensitivity, and finite-sample breakdown point to study the robustness of confidence intervals. Those measures are applied to examine the robustness of unconditional intervals in the regression model for both the regression parameters and the scale and conditional intervals.

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