Statistic Seminar

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November 21, 2011 1.00p.m., HH-3017

Empirical Likelihood based Information Criterion for Change Point Problems

Abstract:

The identification of changes in process parameters is an important statistical problem in industrial-process monitoring. The existing methods, the change point model (Hawkins et al. (2003)) and the modified information criterion (Chen et al. (2006)) rely on the parametric distribution of the quality characteristic, and any deviation from the specified model may lead to incorrect conclusions. We propose an empirical likelihood-based information criterion (ELIC) for identifying changes in the process parameters. Here we defined the empirical likelihood based on set estimating equations for the parameters of interest. The main advantage of our method is that we do not need to specify a parametric distribution for the quality characteristic. Our simulation studies indicate that our method is as good as existing methods when the distribution of the quality characteristic is known, and it outperforms existing methods when the distribution is approximated or misspecified. Our method is applied to two case studies.