Robust individual control chart for change point model

ABSTRACT

Control charts are used to monitor for changes in a process by distinguishing between common and special causes of variability. When a control chart signals, process engineers must initiate a search for the special cause of the process disturbance. Identifying which combination of the many process variables is responsible for a change in the process allows engineers to improve quality by preventing or avoiding changes in those variables which lead to poor quality. We examine a process-monitoring tool that not only provides speedy detection regardless of the magnitude of the process shift, but also provides useful change point statistics. Robustness against assignable causes of variation appears to be important and a likelihood ratio method is used to develop test statistics for step change shifts.The performance of the proposed methodology is demonstrated with numerical example and simulation studies.