Change point detection with robust control chart.

ABSTRACT

Monitoring a process over time using a control chart allows quick detection of unusual states. In phase I, some historical process data, assumed to come from an in-control process, are used to construct the control limits. In Phase II, the process is monitored for an ongoing basis using control limits from Phase I. In Phase II, observations falling outside the control limits or unusual patterns of observations signal that the process has shifted from in-control process settings. Such signals trigger a search for assignable cause and, if the cause is found, corrective action will be implemented to prevent its recurrence. The purpose of this paper is to introduce a new methodology appropriate for constructing a robust control chart when a nonnormal or a contaminated data that may arise in phase I state. Through extensive Monte Carlo simulations, we examine the behaviors and performances of the proposed MM robust control chart when there is a process shift in mean.

Keyword: Robust control chart; Change point detection.