A Gaussian Process Control Chart for Monitoring Automated Process Data

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Abstract

Autocorrelated data arises in a variety of processes. To statistically monitor such processes, special tools are needed to account for these correlations. In this paper, we propose a new monitoring technique based on the use of Gaussian Process models. The proposed monitoring method is powerful yet simple to use technique since it only requires a basic knowledge in statistics and optimization. Simulation results show that the performance of the proposed method is similar to that of the individuals control chart applied to independent process data. The proposed method is illustrated with a real process data taken from the literature.

Keywords: Average Run Length, Assignable Causes, Covariance Structure, Likelihood function.