EFFECTIVE CONTROL CHART PATTERN RECOGNITION USING ARTIFICIAL NEURAL NETWORKS AND STATISTICAL FEATURES

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Abstract

Control charts pattern recognition is one of the most important tools in statistical process control to identify process problems. Unnatural patterns exhibited by such charts can be associated with certain assignable causes affecting the process. Most of the previous work in intelligent statistical process control (SPC) used raw data as input vector representation .The objective of this study was to evaluate the relative performance of a feature-based optimized SPC Recognizer compared with the raw data-based optimized recognizer. The study focused on recognition of seven commonly researched SPC patterns plotted on the Shewhart X-bar chart. The ANN-based SPC pattern recognizer trained using the six selected statistical features resulted in significantly better performance compared with the raw data-based recognizer for the considered five algorithms for two categories of generalization i.e with early stopping and without early stopping.

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