Contribution ID: **23** Type: **not specified**

Process Improvement by Feedback Adjustment Methods

Statistical Process Control (SPC) and its numerous extensions/generalisations focus primarily on process monitoring. This permits identification of out-of-control signals, which might be isolated out-of-control observations or a more persistent process aberration, but says nothing about remedying or controlling them. While isolated out-of-control signals require isolated interventions, a more persistent process deficiency requires more effort to return the process to target. Feedback adjustment involves statistical procedures which aim to improve a process that is subject to deterioration. In its simplest form, feedback adjustment proposes forecasting future values of an unstable process and making adjustments that turn the process back onto target.

In the first part of the presentation, we will review some of the more commonly used feedback adjustment procedures. In particular, we shall discuss the popular exponentially weighted moving average (EWMA) scheme with some of its extensions. These include the effect of adjustment on a perfectly on-target process and selective adjustment to minimise adjustment costs.

In the second part, we will discuss in more detail some of the restrictive assumptions that are made by traditional feedback adjustment techniques and suggest how they might be relaxed. For example, it is commonly assumed that there exists only one compensatory variable that can be changed to adjust the process, that the system is responsive (i.e., changes made take full effect before the next observation), and that the process gain is known. Relaxing these assumptions is required before feedback adjustment can be applied to modern manufacturing problems.

Special/ Invited session

Classification

Mainly methodology

Keywords

EWMA, Process improvement, time series

Primary author: TRIANTAFYLLOPOULOS, Kostas (University of Sheffield)

Co-authors: STILLMAN, Eleanor (University of Sheffield); Dr HARRIS, Keith (Sheffield Hallam University)

Presenter: TRIANTAFYLLOPOULOS, Kostas (University of Sheffield)

Track Classification: Statistical Process Monitoring