Performance of the EWMA Controller in the Presence of Noise Factors

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Abstract: The use of statistical adjustments for processes to improve product quality has taken much interest in recent years, mainly in the semiconductor industry where production is batch-to-batch and where there are drift disturbances. One of the most used techniques to make adjustments to the process control schemes are based on the exponentially weighted moving average (EWMA), the popularity of these schemes is due to its easy implementation and robustness to model assumptions. When there are noise factors that can be measured online other more complex control methods such as Bayesian robust online Control or Certainty Equivalence control where control is automatic and requires measuring noise factors can be used, these control methods prove to be more expensive. In this paper we present a study EWMA controller performance in the presence of noise factors, the results show that under certain conditions the EWMA gives results similar to more complex control strategies, an example of literature and simulated examples are used to make comparisons.

Keywords: Engineering Control Process, EWMA, Robust Design