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## **Predictive Control Charts (PCC): A Bayesian Approach in Online Monitoring of Short Runs**

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Performing online monitoring for short horizon data is a challenging, though cost effective benefit. Self-starting methods attempt to address this issue adopting a hybrid scheme that executes calibration and monitoring simultaneously. In this work, we propose a Bayesian alternative that will utilize prior information and possible historical data (via power priors), offering a head-start in online monitoring, putting emphasis on outlier detection. For cases of complete prior ignorance, the objective Bayesian version will be provided. Charting will be based on the predictive distribution and the methodological framework will be derived in a general way, to facilitate discrete and continuous data from any distribution that belongs to the regular exponential family (with Normal, Poisson and Binomial being the most representative). Being in the Bayesian arena, we will be able to not only perform process monitoring, but also draw online inference regarding the unknown process parameter(s). An extended simulation study will evaluate the proposed methodology against frequentist based competitors and it will cover topics regarding prior sensitivity. A continuous and a discrete real data set will illustrate its use in practice.

Key Words: Statistical Process Control and Monitoring, Self-Starting, Online Phase I Monitoring, Outlier Detection, Regular Exponential Family.

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