

Special Section Editorial

Produção, vol. 21, n. 2, 2011

For all companies worldwide, the quest for high quality products (and services) has clearly become a key point for business competitiveness. Among the numerous approaches used for improving the quality, the Statistical Process Control (SPC) plays a particularly important role. All around the world, there are many researchers who are developing new SPC methods, trying to implement them into real industrial situations and publishing the results into high level, peer-refereed, international journals. But, surprisingly, for these researchers, there are no recurrent meetings dedicated on this topic only. Based on this finding, it has been decided to fill this gap and to launch in 2009 the first International Symposium on Statistical Process Control (ISSPC'2009, <http://isspc2009.free.fr/>), July 16-17 2009, Nantes, France. The main objective of this symposium was to bring together a reduced number of selected researchers in SPC, let them present and share their current works. The second related objective was to strengthen existing collaborations and to foster new ones. At the end of ISSPC'2009, it has been decided to

- organize the second ISSPC conference in Rio de Janeiro, Brazil from 13 to 15 July 2011,
- publish a special section in an issue of Revista Produção devoted on selected papers submitted by attendees of ISSPC'2009. After a rigorous review process, eight papers were accepted.

The first paper of this special section, entitled “Monitoring the Mean Vector and the Covariance Matrix of Multivariate Processes with Sample Means and Sample Ranges”, co-authored by Machado and Costa, shows that for the multivariate case, the charts based on the standardized sample means and sample ranges (MRMAX chart) or on the standardized sample means and sample variances (MVMAX chart) are similar in terms of efficiency in detecting shifts in the mean vector and/or in the covariance matrix.

The second paper, entitled “Improved Binomial Charts for High-Quality Processes”, authored by Albers, investigates binomial charts as a tool for detecting shifts in processes having a (very) small failure rate and reveals that, compared to the negative binomial control charts, the resulting charts are quite attractive in several aspects, such as detection power.

The third paper, entitled “Monitoring Process Mean with a New EWMA Control Chart”, co-authored by Yang et al., proposes a new arcsine transformed EWMA control chart, based on a nonparametric statistic, to monitor the mean of processes, not necessarily coming from a normal population, and to detect small shifts more quickly.

The fourth paper, entitled “On the Constrained Economic Design of Control Charts: a Literature Review”, authored by Celano, presents a discussion of some new trends in the economic design stream of research and outlines the importance of considering the constraints related to SPC resources availability and modeling the occurrence of random shifts.

The fifth paper, entitled “On Multivariate Control Charts”, authored by Frisen, provides a review of general approaches to multivariate control charts. Suggestions are made on the special challenges of evaluating multivariate surveillance methods that can be applied on industrial production fields as well as detection of bio-terrorism, spatial surveillance and transaction strategies in finance.

The sixth paper, entitled “SPC of Multiple Stream Processes - A Chart for Enhanced Detection of Shifts in One Stream”, co-authored by Epprecht, Barbosa and Simões, proposes an alternative scheme to the one Boyd's group charts and Mortell et al. charts concerning the statistical control of multiple-stream processes. This alternative scheme is based on the differences between the values of the quality characteristic in each particular stream and the average of the values of all streams.

The seventh paper, entitled “Monitoring a Wandering Mean with an np Chart”, co-authored by Ho and Costa, investigates the effect of the wandering behavior of the process mean on the performance of Wu et al. (2009) np_x chart using a Markov chain approach and shows that the required sampling size is only twice larger than the one usually required for the classical Xbar chart.

Finally, the eighth paper, entitled “Economic-Statistical Design of Variable Parameters Non-central Chi-Square Control Chart”, co-authored by de Magalhães and Moura Neto, proposes the monitoring of a single variable by means of a variable parameter non-central chi-square control chart. The design of the chart is accomplished by means of optimizing a cost function using a simulated annealing optimization tool.

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