

values are just greater than that of the p-chart. That is, for smaller to medium shifts ANN model is efficient to detect shift in process.

6. Conclusion

In this paper, ANN model is developed for monitoring the fraction of nonconforming unit. The ANN model is found to be more efficient than the traditional p-chart in monitoring the small shift in fraction of nonconforming unit. For large shift, the ANN model is not optimal but it can compete with the traditional p-chart.

References

- [1] Babak Abbasi (2009), "A neural network applied to estimate process capability of non-normal processes", Sciencedirect, Elsevier.
- [2] Junsu Yi, Victor R. P rybutok and Howard R. Clayton (2001), "ARL Comparisons Between Neural Network Models and \bar{x} -Control Charts for Quality Characteristics that are Nonnormally Distributed", Economic Quality Control, Vol. 16 (2001), No. 1, 5-15.
- [3] M. A. Barghash (2011), "A Diverse Neural Network Ensemble Team for Mean Shift Detection in X-Bar and CUSUM Control Charts", Jordan Journal of Mechanical and Industrial Engineering, Volume 5, Number 4 Pages 291-300.
- [4] Masood, I. and Hassan, A. (2010), "Issues in development of artificial neural network-based control chart pattern recognition schemes", European Journal of Scientific Research, 39, 336-355.
- [5] Montgomery, D. C. (1997), Introduction to statistical quality control, New York: Wiley.
- [6] Pugh, G. A. (1989). "Synthetic neural networks for process control", Computer and Industrial Engineering, 17, 24-26.
- [7] Pugh, G.A. (1991), "A comparison of neural network to SPC charts", Computer and Industrial Engineering, 21, 253-255.
- [8] Pershang Dokouhaki, Farnaz Barzinpour, Amir Afshin Fatahi, Babak Farhang Moghaddam (2010), "A Neural Network Scheme for Process Mean Monitoring in Comparison to Variable Control Charts", The 11th Asia Pacific Industrial Engineering and Management Systems Conference, The 14th Asia Pacific Regional Meeting of International Foundation for Production Research.
- [9] C .S. Cheng (2010), "A neural network approach for the analysis of control chart patterns", International Journal of Production Research, 35:3, 667-697.
- [10] Smith, A. E. (1993-1994), "X-bar and R control chart interpretation using neural computing" International Journal of Production Research, 32, 309-320.
- [11] Yousef S Alhammadi, Michael Adams B (2013), "Neural Network Control Chart Architecture for Monitoring Non-Conformities in a Poisson Process" Ind Eng Manage, 2013, 2:4.

Author Profile



Sharad M. Nimbale received the M.Sc degrees in Statistics from Department of Statistics, Karnataka University, Dharwad. For three years worked as Biostatistician and SAS programmer in the field of clinical research. Since from 2012, he is pursuing the research in Statistical Quality Control at the Department of Statistics, Solapur University, Solapur.



Vikas B. Ghute is an associate professor and head at the Department of Statistics, Solapur University, Solapur (MS), India. He received his PhD in statistics in 2008 from Shivaji University, Kolhapur, India. He is a life member of Indian Society for Probability and Statistics. He is also a life member of International Indian Statistical Association. His research interest is in statistical process control.