Optimization of G-O reliability model using TLBO algorithm

Sumanjali Damarla
II/IV B.Tech
Department of IT, VRSEC,
damarlasumanjali@gmail.com

Anita Teladevalapalli
II/IV B.Tech
Department of IT, VRSEC,
anitateledevalapalli777@gmail.com

Dr.Y.Sangeetha
Associate Professor
Department of IT, VRSEC

The Statistical Process Control (SPC) is the best decision to screen programming unwavering quality process. It helps the product advancement group to distinguish the moves to be made amid programming disappointment process and subsequently guarantees better programming dependability. In this undertaking, we propose a control instrument in view of the total perceptions of the disappointments which are ungrouped information utilizing an endless disappointment mean esteem work G-O show, which is Non-Homogeneous Poisson process (NHPP) based. Most extreme Teaching Learning Based Optimization technique (TLBO) approach is utilized to assess the obscure parameters of the model.

KEYWORDS - Statistical Process Control; Software Reliability; Non-Homogeneous Poisson Process (NHPP)

SOFTWARE RELIABILITY

A Model which depicts about mistake discovery in programming Reliability is called Software Reliability Growth Model. We accept that the product framework is liable to disappointment arbitrarily because of programming mistakes. At whatever point, there is a product disappointment, it is evacuated and expected, that new blunders are not presented.

NHPP Exponential Models

Goel-Okumoto Model:

This is a nonstop time – free and indistinguishable mistake conduct display. Time between the exchanges of x (t) is taken to be exponentially dispersed with rates subject to the present blame substance of the framework. The Prediction of the model can be given as

$m(t) = a(1 - e^{-bt})$

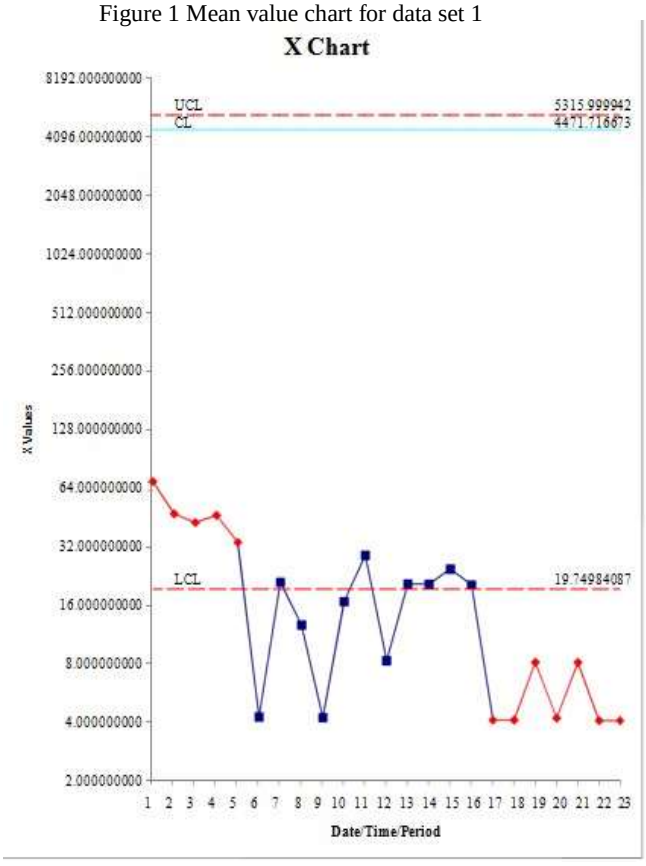
Dataset #1: Real-Time Command and Control Systems

The data set 1 was reported by Musa (1987) based on failure data from a real- time command and control system, which represents the failures observed during system testing for 25 hours of CPU time. The delivered number of object instructions for this system was 21,700 and was developed by Bell Laboratories.

Dataset # 2: Telecommunication System Data

The dataset #2 was reported by Zhang (2002) based on system test data for a telecommunication system. System test data consisting of two releases (Phases 1 and 2) are shown in table 2. In both the tests, automated test and human involved tests are executed on multiple test beds.

Figure 1 Mean value chart for data set 1



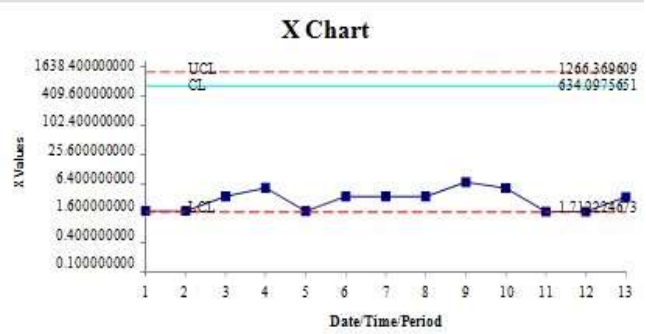


Figure 2 Mean value chart for data set 2

From the analysis of the two data sets, it is observed that in early stages we found the software failures. The results of the graph describe that the reliability in data set 1, lower control limit is touched at the sixth hour while in data set 2, lower control limit is touched at the first hour. Therefore, we conclude that optimizing software reliability of G-O model is performing well.

REFERENCES

R. V. Rao, V. J. Savsani, and D. P. Vakharia, "Teaching– learning-based optimization: A novel method for constrained mechanical design optimization problems,"

R. V. Rao and V. Patel, "An improved teachinglearning-based optimization algorithm for solving unconstrained optimization problems,"