This Doctoral Thesis entitled “SPRT BASED SOFTWARE RELIABILITY: HLSRGM” was taken up at the instance of Dr. R. Satya Prasad, Associate Professor of Computer Science, Acharya Nagarjuna University, motivated, as I was, by a desire to study some problems of using Statistical Process Control (SPC) techniques for assessing software reliability using Non-Homogeneous Poisson Process (NHPP) based Half Logistic Distribution (HLD) as mean value function. Control mechanisms to develop control charts and to assess whether process is under control or out of control were developed. Chapter 1 is on software reliability, software process, SPC preliminaries with exhaustive literature relevant to the proposed study. In all we studied four problems which in brief are

A control scheme which can be easily and fruitfully applied to monitor the software failure process for Half Logistic Distribution based on NHPP using Maximum Likelihood Estimate (MLE) method for parameter estimation for different time domain datasets is developed and results are presented in Chapter 3.

A control mechanism, based on time between failures observations using Half Logistic Distribution with Modified Maximum Likelihood Estimation (MMLE) which is based on NHPP for different datasets is developed and results are presented in Chapter 4.

A control mechanism based on order statistics of cumulative quantity between observations of time domain failure data using mean value function of HLD based on NHPP is developed and applied on different datasets and results are presented in Chapter 5.

A control scheme which can be easily and fruitfully applied to monitor the software failure process for Half Logistic Distribution based on NHPP and using Maximum Likelihood Estimate (MLE) method for parameter estimation for different Interval domain datasets is developed and results are presented in Chapter 6.
The respective brief contents of these four problems are given in the “Introduction” of Chapters 2 to 6. The numerical calculations and subsequent tables are provided at appropriate places in the respective chapters. The reprints of some of our findings in published form are appended towards the end of the thesis. List of references arranged alphabetically is also provided towards the end of the thesis.