PREFACE

This Doctoral Thesis entitled “MONITORING BURR TYPE XII SOFTWARE QUALITY” was taken up at the instance of Dr. R.Satya Prasad, Associate Professor, Acharya Nagarjuna University, Nagarjuna Nagar, to do research in developing the growth models for assessing the reliability of software. The main objective of this thesis is to do study the problems in Software Reliability Engineering and develop few techniques/methodologies for assessing the quality of software by using Statistical Process Control (SPC) and Sequential Probability Ratio Test (SPRT).

Various software reliability growth models have been proposed during the last three decades to assess the reliability of the software. An optimized estimation of parameters of software reliability growth models is the matter of concern as the accurate prediction of reliability depends on these parameters. The traditional MLE (Maximum Likelihood Estimation) is used to evaluate these parameters. The thesis documents the control mechanisms to develop the control charts to assess the software reliability by specifying whether the process is under the control or out of control. Chapter 1 mainly discuss about the software reliability, software reliability growth models, SPC & SPRT preliminaries. To be specific, I have studied three problems which in brief are explained in the following lines.

Our attempts and findings in these directions are presented in the chapters that follow with an aim of proposing analytical techniques for quality software. Chapter 2 is on the exhaustive review of literature. Chapter 3 is on methodology for proposed study.

Reliability Prediction and analysis for software failure process of Time domain data based on Burr Type XII distribution of NHPP using Maximum Likelihood Estimation (MLE) method for parameter estimation is illustrated with different datasets in Chapter 4.

A control scheme, SPC can be applied to assess the software failure process for Time domain data based on Burr Type XII distribution of NHPP using Maximum Likelihood Estimation (MLE) method for parameter estimation is illustrated with different datasets in Chapter 5.
Detection of reliable software components, based on Time domain data using Burr Type XII model of NHPP with SPRT for different datasets is developed and results are presented in Chapter 6. Summary and conclusion with future scope is presented in Chapter 7.

The respective brief contents of these three problems are given in the “Introduction”. The numerical calculations and subsequent tables are provided at appropriate places in the respective chapters. List of references are arranged alphabetically and some of our findings in published form are appended towards the end of the thesis.