PREFACE

This Doctoral thesis entitled “SOFTWARE QUALITY ASSESSMENT USING PARETO TYPE IV MODEL” was taken up at the instance of Dr. R. Satya Prasad, motivated, as I was, by a desire to study some problems of using Statistical Process Control (SPC) techniques for assessing software reliability using Non-Homogenous Poisson Process (NHPP) and a special case of Pareto distribution 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, SPC preliminaries, parameter estimation methods, Sequential Probability Ratio Test (SPRT), failure dataset analysis and the model under consideration. The exhaustive literature relevant to the proposed study is presented in Chapter 2. In all we studied three problems which in brief are

- Reliability Prediction and analysis for software failure process of Interval domain data based on Pareto Type IV distribution of NHPP using Maximum Likelihood Estimation (MLE) method for parameter estimation is illustrated with different datasets in Chapter 3.

- A control scheme, SPC can be applied to assess the software failure process for Interval domain data based on Pareto Type IV distribution of NHPP using Maximum Likelihood Estimation (MLE) method for parameter estimation is illustrated with different datasets in Chapter 4.

- Detection of reliable software components, based on Interval domain data using Pareto type IV distribution model of NHPP with SPRT for different datasets is developed and results are presented in Chapter 5.

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.