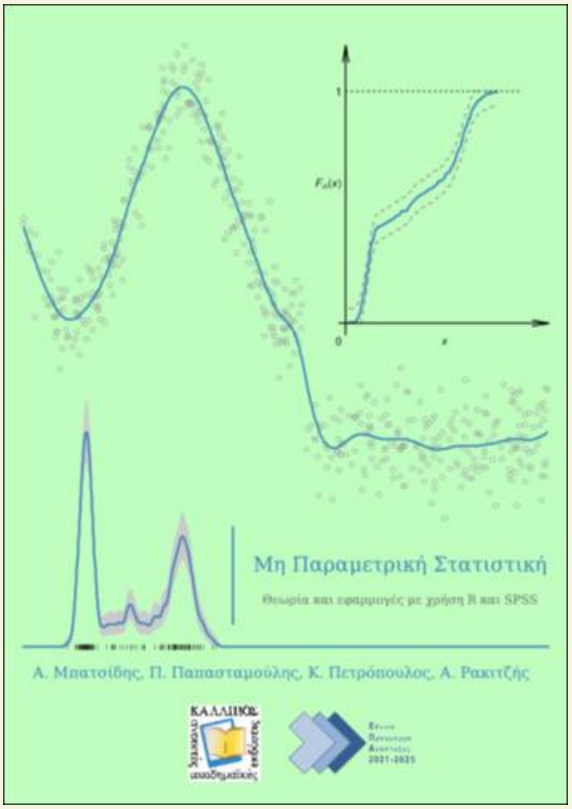

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Abstract

The main aim of this book is to present both traditional Nonparametric Methodologies (such as tests based on ranks, runs, goodness-of-fit tests) as well as subsequent developments (estimation of the probability density function, bootstrap, nonparametric regression). Specifically, in Chapter 1 a review of basic definitions and concepts from Probability Theory and Statistics is given. Moreover, an introduction to the area of Nonparametric Statistics is provided, in which the necessity of nonparametric methodologies, their differences with their parametric counterparts and relevant areas of application are presented. Chapter 2 consists of methods and techniques for the nonparametric estimation of the cumulative distribution function and its functionals, while, in Chapter 3, we provide the main methods for the nonparametric estimation of the probability density function. Chapter 4 is devoted to goodness-of-fit tests, while Chapter 5 presents the simplest hypothesis testing techniques, those that are based on the Binomial distribution.

In Chapter 6 we provide a wide variety of nonparametric, techniques for statistical hypothesis testing, which techniques are based on ranks, while randomness tests are presented in Chapter 7. In Chapter 8 we provide the main nonparametric statistical measures for the correlation of two variables. The corresponding nonparametric statistical tests for correlation are also provided. Nonparametric regression techniques are discussed in Chapter 9, while resampling methods, such as jackknife and bootstrap, are presented in Chapters 10 and 11, respectively. Chapter 12 deals with basic nonparametric techniques in statistical process control, while Chapter 13 presents the application of various nonparametric methodologies using SPSS and R. In addition, we provide statistical tables in the Appendix which enable the application of the statistical techniques presented in the main part of the book. Finally, the webpage https://github.com/abatsidis/NPDataSets allows access to the datasets and R codes used in the chapters of this book.

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