

Recent Developments in Modeling and Applications in Statistics

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Preface

Statistics has been turning into a main tool in almost every field of activity, either purely theoretical or as an essential part of scientific applied work, supporting conclusions and giving insight into new possibilities of usage of methods and results, thus being an essential tool helping in *looking for faceless facts*. The construction of models describing populations or phenomena including random behavior uses a wide range of methods. The recollection of data is at the basis of this modeling and verification of assumptions, thus sampling methodologies appear naturally as an essential object of interest in statistical applications. The modeling process must then be conducted using the suitable techniques giving the researcher the means to search for hidden facts and behaviors. This modeling may be addressed by fitting well predefined shapes and distributions to the data or leaving the data to unveil its intrinsic properties by using the usually more computational demanding, nonparametric methods. If these imply the usage of larger data sets, the parametric description redirects the work toward estimation and hypothesis testing, which can help detecting inconvenient initial choices for the modeling effort.

Reflecting the above-mentioned problems, this volume is organized into six chapters, each one dedicated different approaches to the description and modeling process. The first chapter will include a few contributions on sampling and modeling concerned with direct description of the population under study, possibly using different statistically based methodologies. The second chapter includes contributions concerned with estimation problems, deferring to later chapters a few papers concerned with estimation problems in some more particular frameworks or with testing hypothesis. The final chapter includes contributions of more general flavor.

This volume contains peer reviewed selected contributions presented at the XVIII Annual Congress of the Portuguese Statistical Society that took place at S. Pedro do Sul from September 29 to October 2, 2010, bringing together not only both theoretical and applied statisticians mainly working in Portugal but also a number of Brazilian and Spanish specialists, a few invited well-known specialists and a minicourse opening the conference. The main emphasis on the call for contributions, selection of plenary talks, and minicourse was put on estimation with a particular interest on nonparametric methods and also on the usage of sampling procedures and methodologies, due to the approach of the Portuguese Census. The XVIII Annual Congress of the Portuguese Statistical Society was attended by more than 170 participants, including those who participated in a special session organized

by the Italian Statistical Society as a consequence of a cooperation between several national societies, which also produced the interest on publishing this volume. These participants presented 81 contributed sessions, scattered by 29 sessions and 42 poster contributions.

The editorial committee wishes to express its deep gratitude to everyone who contributed their work to the present volume. The editorial committee is largely indebted to the anonymous referees who kindly helped us on the evaluation process that preceded the final preparation of this volume.

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