

THEORETICAL & APPLIED ISSUES IN STATISTICS & DEMOGRAPHY

Edited by

Christos H Skiadas, *ManLab, Dept. of Production Engineering and Management, Technical University of Crete, Chania, Crete, Greece.* www.cmsim.net

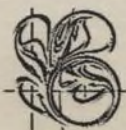
This is the second book devoted to the 15th Applied Stochastic Models and Data Analysis International Conference held in Mataró, Spain, June 25-28, 2013. Revised and expanded forms of papers from the conference presentations are included.

ASMDA main objective is to publish papers, both theoretical or practical, presenting new results having potential for solving real-life problems. Another important objective is to present new methods for solving these problems by analyzing the relevant data. Also, the use of recent advances in different fields is promoted such as for example, new optimization and statistical methods, data warehouse, data mining and knowledge systems, computing-aided decision supports and neural computing.

Demographic models, methods and techniques are especially emphasized in this volume. In particular the three first chapters on Kernel Smoothing, New Developments in Modeling Survival-type Data in Education and New Developments in Demography cover demographic issues and the interrelations between statistics, stochastic and probabilistic methods and demography and related quantitative and qualitative applications along with data analysis, smoothing techniques and forecasting.

Furthermore the next three chapters cover Distance measure, Index of satisfaction, Variations of PageRank, L1 Quantile Regression, Optimal Regimes in Bar Model, Stochastic modeling, Reliability Evaluation and Monte-Carlo Simulation, Neural networks, Neuro-fuzzy techniques, Amplitude Model and Evaluation period of managers.

This book, like others in this ASMDA series is directed towards researchers and others in the fields of probability and statistics, data analysis and forecasting, demography and insurance, finance and management. It is a valuable tool for demographers, actuaries, mathematicians and statisticians, economists and policy makers.



ISAST

ISBN: 978-618-81257-7-3



9 786188 125773 >

Contents

Preface	iii
Chapter 1	
Kernel Smoothing (Ivanka Horová)	1
<i>Dagmar Lajdová, Jan Koláček, and Ivanka Horová</i>	
Kernel Regression Model With Correlated Errors	3
<i>Kateřina Konečná, Ivanka Horová, and Jan Koláček</i>	
Conditional Density Estimations	15
<i>Kamila Hasilová, Ivanka Horová and Jan Koláček</i>	
Bandwidth matrix selectors for multivariate kernel density estimation	33
<i>José Chacón, and Pablo Monfort</i>	
A comparison of bandwidth selectors for mean shift clustering	47
<i>Martin Řezáč</i>	
Kernel and ESIS estimates of J-divergence	61
Chapter 2	
New Developments in Modeling Survival-type Data in Education	79
<i>(Aglaia Kalamatianou)</i>	
<i>Aglaia Kalamatianou</i>	
Survival (Time to Event)-Type Data in Educational Research: Fundamentals & Applications	81
<i>Aglaia Kalamatianou, Adele H. Marshall, and Mariangela Zenga</i>	
Coxian Phase-type Distributions, Survival Trees and the Gini Index Collaborating together to Provide an in-Depth Knowledge of the Distribution of the Length of University Studies	103
<i>Franca Crippa, Marcella Mazzoleni and Mariangela Zenga</i>	
Undergraduate Students' Career in Italy: A Non-Homogeneous Markov Approach with Fuzzy States	121
Chapter 3	
New Developments in Demography (Christos H. Skiadas)	137
<i>Christos H Skiadas</i>	
The Gompertz Model Revisited: Exploring the Health Status of a Population	139

<i>K. N. Zafeiris</i>	
Period fertility rates and the problem of tempo distortions	149
<i>Mariarosaria Coppola, Valeria D'Amato</i>	
How Longevity Volatility influences the Insurance Solvency Capital Requirements	183
<i>Natalia S. Gavrilova and Leonid A. Gavrilov</i>	
New approaches to study historical evolution of mortality (with implications for forecasting)	195
<i>Ana Borges, Inês Sousa, and Luís Castro</i>	
Breast Cancer Survival at Braga's Hospital-Portugal	209

Chapter 4

Distance measure, Index of satisfaction, Variations of PageRank, L1 Quantile Regression	221
<i>M. Symeonaki and G. Stamatopoulou</i>	
Intergenerational mobility as a distance measure between probability distribution functions	223
<i>Raquel Oliveira, A. Manuela Gonçalves, and Rosa M. Vasconcelos</i>	
An empirical study on the index of satisfaction of student allocation in the Portuguese undergraduate engineering courses	231
<i>Christopher Engström, Sergei Silvestrov, and Thierry Hamon</i>	
Variations of PageRank with application to linguistic data	239
<i>Sidi Zakari Ibrahim, Mkhadri Abdallah, and N'Guessan Assi</i>	
Stability Selection and Randomization in L1 Quantile Regression	249

Chapter 5

Optimal Regimes in Bar Model, Stochastic modeling, Reliability Evaluation and Monte-Carlo Simulation	261
<i>Larisa Manita</i>	
Optimal Chattering Regimes in Nonhomogeneous Bar Model	263
<i>N. N. Novitsky, O. V. Vanteyeva</i>	
Stochastic modeling of hydraulic operating parameters in pipeline systems	273
<i>Evgeny Gershikov and Samuel Kosolapov</i>	
Reliability Evaluation of Custom 2D Barcode OCR by using Monte-Carlo Simulation	287
<i>Samuel Kosolapov</i>	
Reliability Evaluation of Multi-Camera Motion Detector by using Monte-Carlo Simulator	295

Chapter 6

Neural networks, Neuro-fuzzy techniques, Amplitude Model, Evaluation period	301
<i>Atsalakis George, Tsakalaki Katerina and Skiadas Christos</i> Forecasting semiconductor sales by a neuro-fuzzy technique	303
<i>Carmen Capilla</i> A comparison of artificial neural networks to forecast nitrogen dioxide concentrations	313
<i>Javier J. Hernández G., María J. García G., and José G. Hernández R.</i> The sports fantasy leagues and the Amplitude Model	325
<i>Evgeny A. Ivin, Alexey N. Kurbatskiy, and Alexander V. Slovesnov</i> Estimating evaluation period of a fund manager	339
Author Index	349