Book of Abstracts

5th Stochastic Modeling Techniques and Data Analysis International Conference with Demographics Workshop

SMTDA2018

Editor

Christos H Skiadas

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Preface

It is our pleasure to welcome the guests, participants and contributors to the International Conference (SMTDA 2018) on Stochastic Modeling Techniques and Data Analysis and (DEMOGRAPHICS2018) Demographic Analysis and Research Workshop.

The main goal of the conference is to promote new methods and techniques for analyzing data, in fields like stochastic modeling, optimization techniques, statistical methods and inference, data mining and knowledge systems, computing-aided decision supports, neural networks, chaotic data analysis, demography and life table data analysis.

SMTDA Conference and DEMOGRAPHICS Workshop aim at bringing together people from both stochastic, data analysis and demography areas. Special attention is given to applications or to new theoretical results having potential of solving real life problems.

SMTDA 2018 and DEMOGRAPHICS 2018 focus in expanding the development of the theories, the methods and the empirical data and computer techniques, and the best theoretical achievements of the Stochastic Modeling Techniques and Data Analysis field, bringing together various working groups for exchanging views and reporting research findings.

We thank all the contributors to the success of these events and especially the authors of this Book of Abstracts. Special thanks to the Plenary, Keynote and Invited Speakers, the Session Organisers, the Scientific Committee, the ISAST Committee, Yiannis Dimotikalis, the Conference Secretary Mary Karadima and all the members of the Secretariat.

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Christos H. Skiadas
Conference Co-Chair

possible to generalize Lévy processes within extremely flexible constructs. These construct have in turn enabled researchers to create Bayesian models of all sorts, especially hierarchical ones, with stables of docile prior probability families out of which posteriors can be computed, In this paper we concentrate on the link between Lévy processes which are set-indexed and corresponding Bayesian models while proposing novel ideas on how this can be exploited.

Keywords: Lévy processes, Bayesian models, priors.

A Projection Pursuit Algorithm for Preference Data

Mariangela Sciandra[1], Antonio D'Ambrosio[2], Antonella Plaia[1]
[1]Dept of Economics, Business and Statistics, Universit degli Studi di Palermo, Italy, [2]Dept of Economics and Statistics, University of Naples Federico II, Italy

In the framework of preference rankings, the interest can lie in finding which predictors and which interactions are able to explain the observed preference structures. The last years have seen a remarkable owering of works about the use of decision tree for clustering preference vectors. As a matter of fact, decision trees are useful and intuitive, but they are very unstable: small perturbations bring big changes. This is the reason why it could be necessary to use more stable procedures in order to clustering ranking data. In this work, following the idea of Bolton (2003), a Projection Pursuit (PP) clustering algorithm for preference data will be proposed in order to extract useful information in a low-dimensional subspace by starting from a high but most empty dimensional space.
Projection pursuit clustering is a synthesis of projection pursuit and nonhierarchical clustering methods that simultaneously attempts to cluster the data and to find a low-dimensional representation of this cluster structure. As introduced by Huber (1985), a PP algorithm consists of two components: an index function $I(\alpha)$ that measures the "usefulness" of projection and a search algorithm that varies the projection direction so as to find the optimal projections, given the index function $I(\alpha)$ and the data set X. In this work a proper specified Projection index function for discrete data will be defined: several distances will be used to evaluate distances between the density of the projected data and the uninteresting uniform density. We also propose diagnostics for finding the optimum number of clusters in projection pursuit clustering. All the methodology is illustrated and evaluated on one simulated and one real dataset.

Keywords: Projetion pursuit, preference data, Clustering rankings.

References

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