PROGRAMME AND ABSTRACTS

International Association for Statistical Computing

3rd World Conference on Computational Statistics & Data Analysis

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TEX

(F7.3) 25_13 **Extended leaps: a modern implementation of a time tested classic**

Presenter: ..... A. Pedro Duarte Silva@Univ. Catolica Portuguesa at Porto, Portugal

A recurrent theme in applied statistics and data analysis is the selection, or comparison, of the subsets extracted from an initial pool of candidate variables. After an appropriate comparison criterion has been agreed upon, two important problems still need to be resolved: (i) how to conduct an efficient search amongst all the different variable subsets. (ii) how to account for any selection bias that may result from the search procedure. In the context of linear regression models, these problems were extensively studied and effective algorithms to deal with the first problem are known since the nineteen seventies. One of the most successful of them is the Leaps and Bounds algorithm of Furnival and Wilson, which combining a smart reuse of previous computations with branch and bound search techniques is able to compare all possible subset regressions in a reasonable time for problems with up to 30 or 40 original variables. Furthermore, for larger problems, the Leaps algorithm can also be run for a limited time behaving in this case as very effective heuristic. Extensions of the algorithm to deal with generalized linear models, multiple group discriminant analysis, linear models with multivariate responses and exploratory multivariate analysis, have been developed latter and are publicly available as stand alone programs. This presentation will present an implementation of the Leaps algorithm that, using modern Object Oriented techniques, separates its main search strategies into independent routines of a C++ library. These routines can be easily incorporated into search, variable selection and correction of selection bias procedures, for different classes of statistical problems. The issues regarding the choice of particular strategies to apply to each problem will be discussed, and a console application that uses the library to implement some of the most important adaptations of the algorithm will be reviewed.

Dear Friends and Colleagues,

Welcome to the 3rd International Association for Statistical Computing (IASC) World Conference on Computational Statistics and Data Analysis. The conference co-chairs are happy to host this international conference in Cyprus.

The conference aims at bringing together researchers and practitioners to discuss recent developments in computational methods, methodology for data analysis and applications in statistics. It is associated with the Computational Statistics and Data Analysis (CSDA), the official journal of the IASC. This is an international journal dedicated to the dissemination of methodological research and applications in the areas of computational statistics and data analysis. The CSDA impact factor has risen dramatically over the past years to 1.022, thanks to the effort of the Editorial Board. We wish to personally thank the Associate Editors who have worked so hard and diligently.

The Conference consists of a number of topics (tracks) with their own "Call For Papers" and Chairs. The programme consists of 70 regular sessions, 4 keynote talks, 4 tutorials and over 400 presentations. There are approximately 500 participants. Peer review papers will be considered for publication in thematic special issues of the CSDA journal, or speedily reviewed for publication in regular issues. We are encouraging all participants to consider the CSDA as the medium of publishing their research results.

The co-chairs have endeavored to provide a balanced and stimulating programme that will appeal to the diverse interests of the IASC and its 700 members. The local organizing committee hope that the conference venue will provide the appropriate environment to enhance your contacts and to establish new ones.

The conference is a collective effort of many individuals and organizations. The Advisory Board, Scientific Programme Committee, the Local Organizing Committee and volunteers have contributed substantially to the organization of the conference. We are acknowledging the support of our sponsors and particularly the Department of Public and Business Administration, University of Cyprus, the ERCIM consortium, the European and International Affairs Department of INRIA and INRIA-IRISA, Rennes, France. We are especially grateful to the members of the Matrix Computations and Statistics group Petko Yanev, Mark Hofmann, Cristian Gatu and Paolo Foschi. They have handled most of the technical and organizational aspects of this conference.

We hope that you enjoy the conference and your stay in Cyprus.

The conference co-chairs:
Stanley Azen, *Erricos John Kontoghiorghes* and *Jae Chang Lee*

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