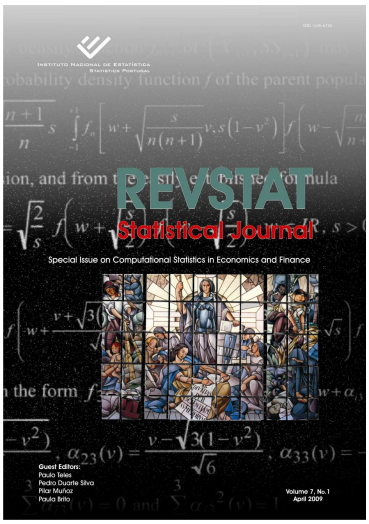
17 July, 2009

Multithemes

Volume 7, Number 2, June 2009

REVSTAT- STATISTICAL JOURNAL

REVSTAT-STATISTICAL JOURNAL, Volume 7, No. 2 – June 2009



In 2003 the National Statistical Institute launched the scientific statistical journal **REVSTAT-STATISTICAL JOURNAL**, published in English two times a year, with a prestigious international Editorial Board, which came to substitute the *Revista de Estatística* [Statistical Review], published in Portuguese between 1996 and 2002.

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This Volume of **REVSTAT: Volume 7, No. 2 - June 2009**, includes four articles. Their abstracts are presented below:

resample; (iv) obtain a bootstrapped replica of the time series according to the AR model and exponential smoothing components found in first step; (v) forecast future values according to model in (i); (vi) compute the point **FORECASTING TIME SERIES WITH BOOT.EXPOS PROCEDURE**

Authors: *Clara Cordeiro* and *M. Manuela Neves*.

To forecast future values of a time series is one of the main goals in times series analysis. Many forecasting methods have been developed and its performance evaluated. In order to make a selection among an avalanche of such emerging methods they have to be compared in a kind of forecasting competition. One of these competitions is the M3 competition with its 3003 time series. The competition results in Makridakis and Hibon (2000) paper are frequently used as a benchmark in comparative studies.
The Boot.EXPOS approach developed by the authors, combines the use of exponential smoothing methods with the bootstrap methodology to forecast time series. The idea is to join these two approaches (bootstrap and exponential smoothing) and to construct a computational algorithm to obtain forecasts. It works in an

automatic way and can be summarized as follows: (i) choose an exponential smoothing model, among several proposed using the mean squared error, and obtain the model components; (ii) fit an AR to the residuals of the adjusted model; the order of the AR is selected by AIC criterion; (iii) center the new residuals obtained in previous step and forecast as the mean or as the median of the predicted values. The performance of the procedure here proposed is evaluated by comparing it with other procedures presented in the M3 competition. Some accuracy measures are used for that comparison. All computational work is done using the R2.8.1 software (R Development Core Team, 2008).

MONITORING INDUSTRIAL PROCESSES WITH ROBUST CONTROL CHARTS

Authors: *Fernanda Figueiredo* and *M. Ivette Gomes.*

The Shewhart control charts, used for monitoring industrial processes, are the most popular tools in *Statistical Process Control* (SPC). They are usually developed under the assumption of independent and normally distributed data, an assumption rarely true in practice, and implemented with estimated control limits. But in general, we essentially want to control the process mean value and the process standard deviation, independently of the data distribution. In order to monitor these parameters, it thus seems sensible to advance with control charts based on robust statistics, because these statistics are expected to be more resistant to moderate changes in the underlying process distribution. In this paper, we investigate the advantage of using control charts based on robust statistics. Apart from the traditional control charts, the sample mean and the sample range charts, we consider robust control charts based on the total median and on the total range statistics, for monitoring the process mean value and the process standard deviation, respectively. Through the use of Monte Carlo simulations, we compare these charts in terms of robustness and performance.

A BAYESIAN SHRINKAGE APPROACH IN WEIBULL TYPE-II CENSORED DATA USING PRIOR POINT INFORMATION

Authors: *Gyan Prakash* and *D.C. Singh*.

In the present paper we study the performance of the Bayes Shrinkage estimators for the scale parameter of the Weibull distribution under the squared error loss and the LINEX loss functions in the presence of a prior point information of the scale parameter when Type-II censored data are available. The properties of the minimax estimators are also discussed.

A SADDLEPOINT APPROXIMATION TO A DISTRIBUTION-FREE TEST FOR STOCHASTIC ORDERING IN THE COMPETING RISKS MODEL

Author: *Hidetoshi Murakami*.

The approximation for the distribution function of a test statistic is extremely important in statistics. A distribution-free test for stochastic ordering in the competing risks model has been proposed by Bagai et al. (1989). Herein, we performed a standard saddlepoint approximation in the tails for the Bagai statistic under finite sample sizes. We then compared the saddlepoint approximation with the Bagai approximation to obtain the exact critical value. The table of the critical values was extended by using the saddlepoint approximation. Additionally, the orders of errors of a saddlepoint approximation were derived.