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This Volume of **REVSTAT: Volume 13, No. 2 - June 2015**, presents the following scientific articles:

LIKELIHOOD RATIO TESTS IN LINEAR MODELS WITH LINEAR INEQUALITY RESTRICTIONS ON REGRESSION COEFFICIENTS

Authors: *Miguel Fonseca, João Tiago Mexia, Bimal K. Sinha and Roman Zmyslony.*

NOTES ON THE REGULAR E-OPTIMAL SPRING BALANCE WEIGHING DESIGNS WITH CORRELATED ERRORS

Authors: *Bronisław Ceranka and Małgorzata Graczyk.*

CONTROL CHARTS FOR MULTIVARIATE NONLINEAR TIME SERIES

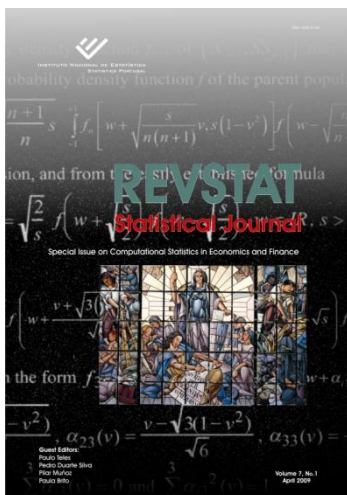
Authors: *Robert Garthoff, Iryna Okhrin and Wolfgang Schmid.*

MODEL OF GENERAL SPLIT-BREAK PROCESS

Authors: *Vladica Stojanović, Biljana Č. Popović and Predrag Popović.*

A BAYESIAN APPROACH FOR JOINT MODELING OF SKEW-NORMAL LONGITUDINAL MEASUREMENTS AND TIME TO EVENT DATA

Authors: *Taban Baghfalaki and Mojtaba Ganjali.*



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This Volume of **REVSTAT: Volume 13, No. 2 - June 2015**, includes five articles. Their abstracts are presented below:

LIKELIHOOD RATIO TESTS IN LINEAR MODELS WITH LINEAR INEQUALITY RESTRICTIONS ON REGRESSION COEFFICIENTS

Authors: *Miguel Fonseca, João Tiago Mexia, Bimal K. Sinha and Roman Zmysłony.*

This paper develops statistical inference in linear models, dealing with the theory of maximum likelihood estimates and likelihood ratio tests under some linear inequality restrictions on the regression coefficients. The results are widely applicable to models used in environmental risk analysis and econometrics.

NOTES ON THE REGULAR E-OPTIMAL SPRING BALANCE WEIGHING DESIGNS WITH CORRELATED ERRORS

Authors: *Bronisław Ceranka and Małgorzata Graczyk.*

The paper deals with the estimation problem of individual weights of objects in E-optimal spring balance weighing design. It is assumed that errors are equal correlated. The topic is focused on the determining the maximal eigenvalue of the inverse of information matrix of estimators. The constructing methods of the E-optimal spring balance weighing design based on the incidence matrices of balanced and partially balanced incomplete block designs are given.

CONTROL CHARTS FOR MULTIVARIATE NONLINEAR TIME SERIES

Authors: *Robert Garthoff, Iryna Okhrin and Wolfgang Schmid.*

In this paper control charts for the simultaneous monitoring of the means and the variances of multivariate nonlinear time series are introduced. The underlying target process is assumed to be a constant conditional correlation process (cf. [3]). The new schemes make use of local measures of the means and the variances based on current observations, conditional moments, or residuals. Exponential smoothing and cumulative sums are applied to these characteristic quantities. Distances between these quantities and target values are measured by the Mahalanobis distance. The introduced schemes are compared via a simulation study. As a measure of performance the average run length is used.

MODEL OF GENERAL SPLIT-BREAK PROCESS

Authors: *Vladica Stojanović, Biljana Č. Popović and Predrag Popović.*

This paper presents a modification (and partly a generalization) of STOPBREAK process, which is the stochastic model of time series with permanent, emphatic fluctuations. The threshold regime of the process is obtained by using, so called, Noise indicator. We proceed to investigate the model which we named the General Split-BREAK (GSB) process. After brief recalling of its basic stochastic properties, we give some procedures of its parameters estimation. A Monte Carlo study of this process is also give, along with the application in the analysis of stock prices dynamics of several Serbian companies which were traded on Belgrade Stock Exchange.

A BAYESIAN APPROACH FOR JOINT MODELING OF SKEW-NORMAL LONGITUDINAL MEASUREMENTS AND TIME TO EVENT DATA

Authors: *Taban Baghfalaki and Mojtaba Ganjali.*

Joint modeling of longitudinal measurements and survival time has an important role in analyzing medical data sets. For example, in HIV data sets, a biological marker such as CD4 count measurements is considered as a predictor of survival. Usually, longitudinal responses of these studies are severely skew. An ordinary method for reducing the skewness is the use of square root or logarithm transformations of responses. In most of the HIV data sets, because of high rate of missingness, skewness is remained even after using the transformations.



Therefore, a general form of distributions for considering skewness in the model should be used. In this paper, we have used multivariate skew-normal distribution to allow a flexible model for considering non-symmetrically of the responses. We have used a skew-normal mixed effect model for longitudinal measurements and a Cox proportional hazard model for time to event variable. These two models share some random effects. A Bayesian approach using Markov chain Monte Carlo is adopted for parameter estimation. Some simulation studies are performed to investigate the performance of the proposed method. Also, the method is illustrated using a real HIV data set. In these data, longitudinal outcomes are skew and death is considered as the event of interest. Different model structures are developed for analyzing this data set, where model selection is performed using some Bayesian criteria.

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