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This Volume of **REVSTAT**, Volume 12 Number 2 June 2014**,** includes five articles:

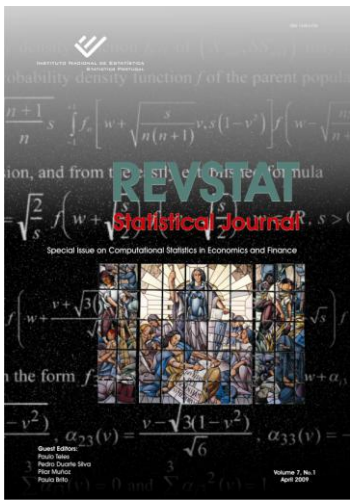
UNIFORM APPROXIMATIONS FOR DISTRIBUTIONS OF CONTINUOUS RANDOM VARIABLES WITH APPLICATION IN DUAL STATIS METHOD
Authors*: João Lita da Silva and Luís Pedro Ramos*

MADOGRAM AND ASYMPTOTIC INDEPENDENCE AMONG MAXIMA
Authors*: Armelle Guillou, Philippe Naveau and Antoine Schorgen*

ON THE UPCROSSINGS OF TRIGONOMETRIC POLYNOMIALS WITH RANDOM COEFFICIENTS
Author: *K.F. Turkman*

EXTREMES OF PERTURBED BIVARIATE RAYLEIGH RISKS
Authors: *Enkelejd Hashorva, Saralees Nadarajah and Tibor K. Pogány.*

ROBUST BOOTSTRAP: AN ALTERNATIVE TO BOOTSTRAPPING ROBUST ESTIMATORS
Authors*: Conceição Amado, Ana M. Bianco, Graciela Boente and Ana M. Pires.*



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This Volume of **REVSTAT: Volume 12, No. 2 - June 2014**, includes five articles. Their abstracts are presented below:

UNIFORM APPROXIMATIONS FOR DISTRIBUTIONS OF CONTINUOUS RANDOM VARIABLES WITH APPLICATION IN DUAL STATIS METHOD

Authors: *João Lita da Silva* and *Luís Pedro Ramos.*

The matrix $\mathbf{S} = [\mathrm{tr}(\mathbf{W}_i\mathbf{Q}\mathbf{W}_j\mathbf{Q})]_{i,j=1,\ldots,k}$ where $\mathbf{Q}$ is a symmetric positive definite matrix and $\mathbf{W}_i = \mathbf{X}_i'\mathbf{D}_i\mathbf{X}_i$, $i=1,\ldots,k$ is formed by data tables $\mathbf{X}_i$ and diagonal matrices of weights $\mathbf{D}_i$, plays a central role in dual STATIS method. In this paper, we approximate the distribution function of the entries of $\mathbf{S}$, assuming data tables $\mathbf{X}_i$ given by $\mathbf{U}_i+\mathbf{E}_i$, $i=1,\ldots,k$ with independent random matrices $\mathbf{E}_i$ representing errors, in order to obtain (approximately) the distribution of $\mathbf{Sv}$, where $\mathbf{v}$ is the orthonormal eigenvector of $\mathbf{S}$ associated to the largest eigenvalue. To achieve this goal, we approximate uniformly the distribution of each entry of $\mathbf{S}$. In general, our technique consists in to approximate uniformly the distribution sequence $\{g(\mathbf{V}_n+\boldsymbol{\mu}_n), n\geq 1\}$, where g is some smooth function of several variables, $\{\mathbf{V}_n, n\geq 1\}$ is a sequence of identically distributed random vectors of continuous type and $\{\boldsymbol{\mu}_n\}$ is a non-random vector sequence.

MADOGRAM AND ASYMPTOTIC INDEPENDENCE AMONG MAXIMA

Authors: *Armelle Guillou, Philippe Naveau* and *Antoine Schorgen*

A strong statistical research effort has been devoted in multivariate extreme value theory in order to assess the strength of dependence among extremes. This topic is particularly difficult in the case where block maxima are near independence. In this paper, we adapt and study a simple inference tool inspired from geostatistics, the madogram, to the context of asymptotic independence between pairwise block maxima. In particular, we introduce an extremal coefficient and study the theoretical properties of its estimator. Its behaviour is also illustrated on a small simulation study and a real data set.

ON THE UPCROSSINGS OF TRIGONOMETRIC POLYNOMIALS WITH RANDOM COEFFICIENTS

Author: *K.F. Turkman*.

Polynomials are one of the oldest and the most versatile classes of functions which are fundamental in approximating highly complex, deterministic as well as random nonlinear functions and systems. Their use has been acknowledged in every scientific field from physics to ecology. Just to emphasize their great use in many fields, we mention their fundamental role in linear and non-linear time series analysis. In this paper, we give a review of some of the results related to polynomials with random coefficients and highlight the Poisson character of high level upcrossings of certain random coefficient trigonometric polynomials which are used in spectral analysis of time series.

EXTREMES OF PERTURBED BIVARIATE RAYLEIGH RISKS

Authors: *Enkelejd Hashorva, Saralees Nadarajah* and *Tibor K. Pogány*.

We establish first an asymptotic expansion for the joint survival function of a bivariate Rayleigh distribution, one of the most popular probabilistic models in engineering. Furthermore, we show that the component-wise maxima of a Hüsler-Reiss triangular array scheme of independent perturbed bivariate Rayleigh risks converges to a bivariate Hüsler-Reiss random vector.

ROBUST BOOTSTRAP: AN ALTERNATIVE TO BOOTSTRAPPING ROBUST ESTIMATORS

Authors: *Conceição Amado, Ana M. Bianco, Graciela Boente* and *Ana M. Pires*.

There is a vast literature on robust estimators, but in some situations it is still not easy to make inferences, such as confidence regions and hypothesis testing. This is mainly due to the following facts. On one hand, in most situations, it is difficult to derive the exact distribution of the estimator. On the other one, even if its asymptotic behaviour is known, in many cases, the convergence to the limiting distribution may be rather slow, so bootstrap methods are preferable since they often give better small sample results. However, resampling methods have several disadvantages including the propagation of anomalous data all along the new samples. In this paper, we discuss the problems arising in the bootstrap when outlying observations are present. We argue that it is preferable to use a robust bootstrap rather than to bootstrap robust estimators and we discuss a robust bootstrap method, the Influence Function Bootstrap denoted IFB. We illustrate the performance of the IFB intervals in the univariate location case and in the logistic regression model. We derive some asymptotic properties of the IFB. Finally, we introduce a generalization of the Influence Function Bootstrap in order to improve the IFB behaviour.

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