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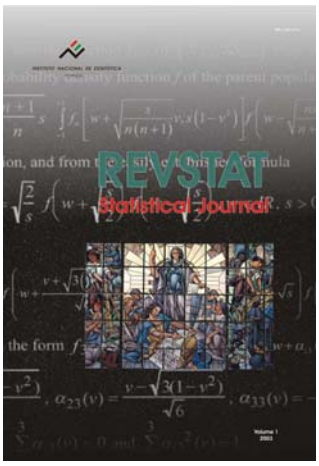

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In 2003 the National Statistical Institute launched the scientific statistical journal **REVSTAT-STATISTICAL JOURNAL**, published in English two times a year, with a prestigious international Editorial Board, which came to substitute the *Revista de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

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This Volume of **REVSTAT: Volume 4, No. 2 - June 2006** includes six articles. Their abstracts are presented below:

IMPROVEMENTS IN THE ESTIMATION OF A HEAVY TAIL

Authors: *Orlando Aníbal Oliveira, M. Ivette Gomes* and *M. Isabel Fraga Alves*

In this paper, and in a context of regularly varying tails, we suggest new tail index estimators, which provide interesting alternatives to the classical Hill estimator of the tail index γ. They incorporate some extra knowledge on the pattern of scaled top order statistics and seem to work generally pretty well in a semi-parametric context, even for cases where a second order condition does not hold or we are outside Hall's class of models. We shall give particular emphasis to a class of statistics dependent on a *tuning* parameter τ, which is merely a change in the scale of our data, from X to X/τ. Such a statistic is non-invariant both for changes in location and in scale, but compares favourably with the Hill estimator for a class of models where it is not easy to find competitors to this classic tail index estimator. We thus advance with a slight "controversial" argument: it is always possible to take advantage from a non-invariant estimator, playing with particular *tuning* parameters — either a change in the location or in the scale of our data —, improving then the overall performance of the classical estimators of extreme events parameters.

PERFORMANCE OF THE *EM* ALGORITHM ON THE IDENTIFICATION OF A MIXTURE OF WATSON DISTRIBUTIONS DEFINED ON THE HYPERSPHERE

Authors: *Adelaide Figueiredo* and *Paulo Gomes*

We consider a set of n individuals described by p standardised variables, and we suppose that the individuals are previously selected from a population and the variables are a sample of variables assumed to come from a mixture of k bipolar Watson distributions defined on the hypersphere. In this context we provide the identification of the mixture through the EM algorithm and we also carry out a simulation study to compare the maximum likelihood estimates obtained from samples of moderate size with the respective asymptotic estimates. Our simulation results revealed good performance of the EM algorithm for moderate sample sizes.

A LOGNORMAL MODEL FOR INSURANCE CLAIMS DATA

Authors: *Daiane Aparecida Zuanetti, Carlos A. R. Diniz* and *José Galvão Leite*

In the insurance area, especially based on observations of the number of claims, $N(w)$, corresponding to an exposure w, and on observations of the total amount of claims incurred, $Y(w)$, the risk theory arises to quantify risks and to fit models of pricing and insurance company ruin. However, the main problem is the complexity to obtain the distribution function of $Y(w)$ and, consequently, the likelihood function used to calculate the estimation of the parameters.
This work considers the Poisson $(w\lambda)$, $\lambda>0$, for $N(w)$ and lognormal (μ,σ^2), $-\infty<\mu<\infty$, and $\sigma^2>0$, for Z_i, the individual claims, and presents maximum-likelihood estimates for λ, μ and σ^2.

A NEW DEPENDENCE CONDITION FOR TIME SERIES AND THE EXTREMAL INDEX OF HIGHER–ORDER MARKOV CHAINS

Author: *Helena Ferreira*

We present a new dependence condition for time series and extend the extremal types theorem.
The dependence structure of a stationary sequence is described by a sequence of extremal functions. Under a stability condition for the sequence of extremal functions, we obtain the asymptotic distribution of the sample maximum.
As a corollary, we derive a surprisingly simple method for computing the extremal index through a limit of a sequence of extremal coefficients.
The results may be used to determine the asymptotic distribution of extreme values from stationary time series based on copulas. We illustrate it with the study of the extremal behaviour of d^{th}-order stationary Markov chains in discrete time with continuous state space. For such sequences we present a way to compute the extremal index from the upper extreme value limit for its joint distribution of $d+1$ consecutive variables.

DECOMPOSITIONS OF SYMMETRY MODEL INTO MARGINAL HOMOGENEITY AND DISTANCE SUBSYMMETRY IN SQUARE CONTINGENCY TABLES WITH ORDERED CATEGORIES

Authors: *Sadao Tomizawa, Nobuko Miyamoto* and *Masami Ouchi*

For square contingency tables with ordered categories, this paper proposes some distance subsymmetry models. The one model indicates that the cumulative probability that an observation will fall in row category *i* or below and column category $i+k$ $(k\geq 2)$ or above, is equal to the probability that it falls in column category i or below and row category $i+k$ or above. This paper also gives the decomposition of the symmetry model into the marginal homogeneity model and some distance subsymmetry models. The father-son occupational mobility data in Britain and the women's unaided vision data in Britain are analyzed.

COMPARISON OF WEIBULL TAIL-COEFFICIENT ESTIMATORS

Authors: *Laurent Gardes* and *Stéphane Girard*

We address the problem of estimating the Weibull tail-coefficient which is the regular variation exponent of the inverse failure rate function. We propose a family of estimators of this coefficient and an associate extreme quantile estimator. Their asymptotic normality are established and their asymptotic mean-square errors are compared. The results are illustrated on some finite sample situations.

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