SCIENCE*SPRING*DAY

Mathematics Department

Statistic Analisys of Extreme Values

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

ipt Instituto Politécnico de Tomar

Frederico Caeiro

2006 - Ph.D. in Statistics, Faculdade de Ciências – Universidade de Lisboa.

2001 – M. Sc. in Probability and Statistics, Faculdade de Ciências – Universidade de Lisboa.

Objectives

Statistics of Extreme Values helps us to learn from disastrous or almost disastrous events, of high relevance in society and with a high societal impact. The domains of application are quite diverse. We mention the fields of hydrology, meteorology, geology, insurance, finance, sports records, structural engineering, telecommunications and biostatistics. We are usually concerned in making inference about characteristics related to the tails of the distribution function F underlying the sample data, such as a high quantile, a small probability of exceedance or the return period of a high level. Our objective is the reduction of bias in the estimation of such quatities.

Methodology

We work under a semi-parametric approach, where the right tail estimation is done under a quite general framework. Under this semi-parametric approach, we use the k top order statistics associated to the n available observations or with the excesses over a high random threshold, assuming only that the maximum suitably linearly normalised of independent, identically distributed random variables converge in distribution to a non-degenerate random variable. Second-order parameters of the right tail are usually decisive for the bias reduction, and we deal with their estimation.

Expected Results

Study new minimum variance reduced bias (MVRB) estimators, in the sense that they keep the same asymptotic Variance and have smaller order of asymptotic bias. Such estimators are less sensitive to the choice of the number of top order statistics used in the estimation.