Tutorial by Armelle Guillou

16 December 2022

Extreme Value Analysis

The tutorial will be organized into three sessions.

A solid background in probability theory and statistics is required, but no prerequisites in Extreme Value Theory. Illustrations on the R software will be made, but it is not requested to install R on your own computer.

➢ 9:00 to 10:20: **Part 1: Introduction to Extreme Value Theory – Univariate Framework**
  - Introduction / Motivation
  - Study of the maximum: the GEV distribution
  - Peaks-Over-Threshold approach
  - Estimation of an extreme value index / extreme quantile

➢ 10:20 to 10:40: Break

➢ 10:40 to 11:45: **Part 2: Estimation of tail parameters in the presence of random covariates**
  - Estimation of the extreme value index in the presence of random covariates
  - Extreme value estimation of the conditional risk premium in reinsurance

➢ 11:45 to 12:05: Break

➢ 12:05 to 13h30: **Part 3: Estimation of tail parameters in the presence of random censoring**
  - Estimators of tail parameters adapted to censoring
  - Bias-corrected estimation for conditional Pareto-type distribution with random right censoring

This last part will be an introduction to the Plenary talk on the estimation of the conditional tail moment and reinsurance premium in the presence of censoring.