

UE Temporal, spatial and extreme event analysis



Level
Baccalaureate
+5



ECTS
6 credits



Component
UFR IM2AG
(informatique,
mathématiques
et
mathématiques
appliquées)



Semester
Automne

- > **Teaching language(s):** English
- > **Open to exchange students:** Yes
- > **Code d'export Apogée:** GBX9AM45

Presentation

Description

Modelling extreme temperatures, extreme river flows, earthquakes intensities, neuronal activity, map diseases, lightning strikes, forest fires, for example is a risk modelling and assessment task, which is tackled in statistics using point processes and extreme value theory.

On the one hand, point processes are a class of stochastic processes modelling random events in interaction. By event we can think of the time a neuron activates, an earthquake occurs, the time a tweet has been retweeted, etc or the location of a tree in a forest, the impact of a lightning strike, etc. The first two parts provide an introduction to stochastic models and statistical inference which could cover such applications. Main characteristics of such processes, standard models (properties, simulation) and statistical procedures to infer them will be presented.

On the other hand, taking into account extreme events such as heavy rainfalls, floods, extreme temperatures is often crucial in the statistical approach to risk modeling. In this context, the behavior of the distribution tail is then more important than the shape of the central part of the distribution. Extreme-value theory offers a wide range of tools for modeling and estimating the probability of extreme events.



Course parts

Lectures

Lectures (CM)

36h

Useful info

Contacts

Program director

Jean-François Coeurjolly

✉ jean-francois.coeurjolly@univ-grenoble-alpes.fr

Campus

› [Grenoble - University campus](#)