Monday
October 21,
2019

12:30 pm
(CET)

The **Working Group on Risk - CREAR**, with the support of the IDS dpt, Institut des Actuaires, LabEx MME-DII, and the group BFA (SFdS), has the pleasure to invite you to the seminar by:

Prof. Holger Rootzén

Chalmers University of Technology, Gothenburg, Sweden

"Is climate change making extreme rains more frequent, or bigger, or more dangerous?"

at ESSEC La Défense (CNIT) – Salle 202, 12:30-1:30pm

Records can become bigger because the underlying distribution changes, or because one makes more tries, or both. Dangers of flooding is determined by the interplay between changes in record sizes and the spatial extents of extreme rainfall events. We use NOAA data with more than 60 years of observation and with observations going up to at least 2010 to study large rainstorms in northeastern USA. Data on daily rain at individual gauge stations provides the most direct path to understanding the how climate change affects rainstorms. However, annual maxima data are more widely available, and often of higher quality. We hence use both kinds of data, together with the close relation between the PoT method with generalized Pareto distributed excesses and the annual maxima method with the generalized extreme value distribution. A preliminary answer is that record rainstorms in northeastern USA are becoming larger because extreme rainfalls are becoming more frequent, but not because the distribution of sizes of individual rainstorm is increasing. To model changes in spatial extent of rainfall events we derive new representations of the GP distributions associated with the stable mixture GEV distributions. These models inherit the appealing properties of the stable mixture GEV models which provide components of variance models, time series models, and spatial and continuous parameter models for annual maxima. Additionally, they allow for simple explicit formulas for densities, and hence for easier ML estimation than competing models. An important challenge is that extremes, say rainstorms, may hit a some, but not all, spatial locations, so that some, but not all, components are extreme. For GP modelling this means that models must be able to accommodate cases where some of the components have mass on their lower boundary, which may be finite or equal to minus infinity.

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For any information:
Stéphanie Martinez – 0134433797 - martinez@essec.edu
http://crear.essec.edu/working-group-on-risk

Prof. Holger Rootzén

Chalmers University of Technology, Gothenburg, Sweden

Holger Rootzén is professor of mathematical statistics at Chalmers University of Technology, Gothenburg, Sweden. He is elected member of the Royal Swedish academy of Sciences, adjunct member committee for awarding the Swedish National Bank's Prize in Economic Sciences in Memory of Alfred Nobel; associate editor for JASA and Extremes; earlier editor for the Scandinavian Journal of Statistics, Bernoulli, and Extremes. He has published about 90 papers in international journals and a book which continues to be a highly cited classic. His WoS h-index is 23 and his Google Scholar h-index 36. His research is about random processes. High-dimensional statistics for extreme episodes, human longevity, and modelling microscopic structures of soft materials is at the center of interest right now. His research contributes to mitigation of the impact of extreme floods, windstorms, and heat waves caused by climate change; to risk handling in finance and insurance; to using naturalistic driving studies to prevent car crashes; and to design of pharmaceutical tablet coatings.

Homepage: http://www.math.chalmers.se/~rootzen/