TAIL CLUSTERING IN HIGH DIMENSION

Speaker: Liujun Chen

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Time&Venue:

SCMS Room 102, Dec. 18 (Thursday), 14:00-15:30

Abstract:

Integrating information across datasets has emerged as a powerful strategy for improving statistical efficiency and predictive accuracy. In extreme value analysis, combining information from multivariate variables is meaningful only when they share similar tail characteristics, such as a common extreme value index. Before applying any pooling estimation technique, it is necessary to group variables based on their tail behavior. This paper tackles this challenge for high-dimensional datasets.

We propose an iterative clustering procedure that sequentially partitions the variables into groups, ordered from the heaviest-tailed to the lightest-tailed distributions. At each step, the method identifies and extracts a subset of variables exhibiting the highest extreme value index among those remaining. This approach differs fundamentally from conventional clustering methods using pre-estimated extreme value indices. We establish the consistency of the algorithm and demonstrate its finite-sample performance through simulations and a real data application.

This is a joint work with Marco Oesting (University of Stuttgart) and Chen Zhou (Erasmus University Rotterdam).

Biography:

Liujun Chen is currently a non-tenured Associate Professor in the Department of Statistics and Finance at the University of Science and Technology of China. He received his Ph.D. from Fudan University under the supervision of Professor Deyuan Li. His research interests include extreme value statistics, nonparametric statistics, and risk management. His work has been published in statistical journals such as *Biometrika* and *Statistica Sinica*.