MACQUARIE UNIVERSITY
STATISTICS DEPARTMENT SEMINAR

Speaker: Professor Irène Gijbels, Department of Mathematics and Leuven Statistics Research Center, KU Leuven, Belgium
Date: Tuesday 31 July 2018, Time 1-2pm
Venue: 14 Sir Christopher Ondaatje Ave, Room 264

Title: Copula-based dependence modeling and applications: what, why and how?

Abstract:
In recent years a lot of research has been devoted to study dependencies between random variables using copulas. The dependence structure between continuous random variables is fully characterized by the (unique) copula function. Similarly, when studying conditional dependencies, the concept of conditional copula function is crucial. Dependencies can be of different nature, with for example tail dependencies or not, symmetric dependencies or not. Further one distinguishes between specific dependency properties such as (in a bivariate setting) positive or negative quadrant dependency, etc. The strengths of the dependencies can be expressed in terms of association measures, such as for example Spearman's correlation coefficient and Kendall's tau. A key issue is that in the bivariate case, these association measures are all functionals of the copula. In a conditional dependence setting, one can talk about conditional association measures. The first part of the talk is concluded by discussing estimation of copula's and conditional copula's, and the corresponding association measures.

In a second part of the talk, the emphasis will be on applications of copula-modeling in applications. As such we pay attention to the so-called simplifying assumption that is often implicitly assumed in vine copula modeling. We also discuss how to exploit the copula-modeling framework in the context of optimizing a portfolio in financial applications.
In short, the aims of this talk are to explain what copulas are, why they are of interest and how to do statistical inference in copula-based dependence modeling. Recent developments in statistical inference for copula-based dependence modeling and future research issues will be discussed.

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