

Preface

This volume of the Brazilian Journal of Probability and Statistics constitutes a special issue of the joint meeting “*The Seventh Conference on Multivariate Distributions with Applications and the First Conference on Applied Probability and Statistical Methods*” held in Maresias, Brazil, on August 8–13, 2010. The joint conference had several speakers from all over the world. First, the editors wish to record their thanks to all those who helped with both the selection and referring of papers of this issue. Several contributed papers were submitted to this special issue and only six papers were selected by the editors as suitable for publication.

A wide range of new theoretical aspects related to the topics of this special issue are discussed: new methods for constructing multivariate exponential and extreme dispersion models, copula modelling in the context of multivariate logistic regression, limit conditions for the Marshall–Olkin multivariate distribution and a tractable subclass of multivariate exponential distributions, copulas related to Manneville–Pomeau processes, polyhazard models with dependent causes as a flexible family for fitting lifetime data and manifold matching task from the perspective of jointly optimizing the fidelity and commensurability.

Jorgensen reviewed an existing method for constructing multivariate proper dispersion models, and introduced new methods for constructing multivariate exponential and extreme dispersion models. He discussed two new types of bivariate gamma models and a new multivariate extreme dispersion model for extremes and survival data. Genest et al. provided additional evidence in favour of copula modelling in the context of multivariate logistic regression. They showed how to test for residual pairwise dependence between responses, given the explanatory variables. The authors’ procedure is based on the score statistic derived from the assumed copula structure under the alternative. They argued that conditional dependence can be conveniently modelled with meta-elliptical copulas, which offer a wide range of positive and negative degrees of association. Mai and Scherer derived necessary and sufficient conditions on the parameters of a given Marshall–Olkin multivariate distribution to be extendible to an infinite exchangeable sequence by arranging the model parameters in a geometric triangular form. Their result allows to decide if the respective multivariate exponential distribution can be constructed by means of a model with conditionally independent and identically distributed.

Further, Lopes and Pumi derived the copulas related to Manneville–Pomeau processes for almost everywhere monotonic functions. The support of the copulas was also derived. They investigated computational issues, approximations and random variate generation and numerical simulations to test the proposed approximations. Tsai and Hotta included dependence among the latent causes of failure by modeling dependence using copula functions. Their models can be able to generate much more flexible risk functions than the independent polyhazard models,