

Bayesian methodology for copulas : the past and the present

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While frequentist methodology is progressing quickly for inference on copulas, Bayesian methodology is less developed. This is unfortunate since the latter provides an interesting framework when there is very little data available or for tasks such as prediction or model selection. The talk has two objectives, the first of which is to explore existing parametric and nonparametric methodology for Bayesian inference on copulas. In particular, in the parametric setting, most of the methodology concerns the Gaussian family because of its popularity in many applied fields such as spatial statistics, and so we will point out the main tools available. More generally, when analyzing data, a practitioner may choose to explore more than a single family, and therefore an important task for practitioners is model selection among common copula families. Bayesian rules have been proposed and will be discussed. While the popular parametric families may be simple and appealing for the applied scientists, they are nonetheless restrictive. As an alternative, the nonparametric literature proposes more flexible models, using sieves for instance, but the MCMC algorithms for numerical computations can become quite challenging here. A difficulty in constructing useful nonparametric approaches is to maintain simplicity. The second objective of the talk is to propose new nonparametric Bayesian methodology for inference on (multivariate) Archimedean copulas exploiting recent results of McNeil and Nešlehová (2009). The methodology is simple and uses (increasingly popular) Approximate Bayesian Computations (ABC) as an alternative to MCMC for numerics. A nice feature of ABC is that explicit knowledge of the likelihood is not necessary as long as it is possible to generate random observations according to the likelihood. In particular, by using this tool, we are able to circumvent the problem of having to model the margins.

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