Simulation of random variables with prescribed marginals and given Pearson's correlations

Barbora Kessel[1, 2]

[1]Helmholtz Centre for Infection Research, Braunschweig
[2]Georg-August University, Göttingen

When evaluating measurement uncertainty using Monte Carlo methods, it is of interest to generate random variables with prescribed distributions and given pairwise Pearson's correlation coefficients. With more than 2 variables, this problem is not very straightforward. In my contribution I would like to point out connection of this problem to both the Bayesian methods and the copula-based techniques. The latter mainly by discussing a simple algorithm published by Dukic and Marić in Physical Review E 87 in 2013. In contrary to some claims in this paper, I will show that the algorithm can be described in terms of copulas and that making the connection to copulas even helps to gain more insight into the algorithm and into its possible extensions.