Pair-copula constructions for non-Gaussian DAG models

Abstract:
We propose a new type of multivariate statistical model that permits non-Gaussian distributions as well as the inclusion of conditional independence assumptions induced by a directed acyclic graph. These models feature a specific factorisation of the likelihood that is based on pair-copula constructions and hence involves only univariate distributions and bivariate copulas, of which some may be conditional. We demonstrate maximum-likelihood estimation of the parameters of such models and compare them to various competing models from the literature. We also present an application to financial return data demonstrating the need for such models.

Stichworte:
Bayesian networks, conditional independence, copulas, graphical models, likelihood inference, regular vines

Zeitschriftentitel: The Canadian Journal of Statistics

Jahr: 2012
Band: 40
Heft / Issue: 1
Seiten: 86 - 109